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STUDIES OF PAPUASIAN PLANTS, VI

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Concluded from page 270

Dubouzetia Pancher

Dubouzetia Pancher (ex Brongn. & Gris in Bull. Soc. Bot. Fr. 8: 199. 1861) is now composed of five species, all endemic to New Caledonia, according to the informative revision by Sprague (in Kew Bull. 1907: 125-128. 1907). The differences between *Dubouzetia* and its closest ally, the Chilean *Tricuspidaria* R. & P. (*Crinodendron* Mol., in part), are adequately discussed by Sprague (loc. cit., also op. cit. 10-12).

The discovery of two New Guinean species which indubitably represent *Dubouzetia* is of especial interest and further illustrates the occurrence of certain floristic elements in both the New Caledonian and Papuasian regions. *Antholoma*, also of the Elaeocarpaceae, is already known to have a similar distribution (see discussion below under *Sloanea*).

***Dubouzetia novoguineensis* sp. nov.**

Arbor ad 14 m. alta partibus juvenilibus sericeo-puberulis inflorescentisque exceptis glabra, ramulis gracilibus apicem versus angulatis vetustioribus subteretibus lenticellatis; petiolis gracilibus nigrescentibus canaliculatis 5-12 mm. longis; laminis chartaceis in sicco fusco-olivaceis ellipticis, (4-) 5-9 cm. longis, 2.5-5.5 cm. latis, basi obtusis et in petiolum decurrentibus, apice obtusis vel rotundatis, margine repando-denticulatis, costa supra elevata subtus prominente, nervis lateralibus utrinsecus 5-7 erecto-patentibus anastomosantibus supra prominulis subtus elevatis, rete venularum copioso utrinque prominulo; inflorescentiis axillaribus vel e ramulis defoliatis ortis breviter racemosis 4-8-floris, pedunculo brevi et rhachi striatis parce puberulis sub anthesi et sub fructu 5-10 mm. longis, bracteis ellipticis puberulis ad 4 mm. longis ante anthesin caducis, pedicellis gracilibus puberulis sub anthesi 15-25 mm. longis sub fructu incrassatis interdum ad 30 mm. longis; sepalis 5 papyraceis oblongo-lanceolatis, 12-14 mm. longis, basim versus 3-4 mm. latis deinde ad apicem subacutum gradatim angustatis, utrinque minute sericeo-puberulis, intus carinatis; petalis 5 membranaceis oblongis, 16-18 mm. longis, 7-8 mm. latis, margine involutis

et basim versus saepe subcohaerentibus, apice rotundatis et obscure 3-vel 4-denticulatis (lobis deltoideis obtusis circiter 0.2 mm. longis), flabellatim paucinervatis et intus inferne inconspicue carinatis, utrinque basim versus et margine parce hirtellis ceterum glabris; disco 10-lobato, lobis carnosus subglobosis circiter 1 mm. diametro superne minute hirtellis; staminibus circiter 31 ubique hispidulo-puberulis 2-vel 3-seriatis, filamentis subteretibus 8-9 mm. longis, antheris 4-4.5 mm. longis; ovario 3-5-loculari subgloboso-ovoideo dense aureo-sericeo, loculis 6-ovulatis, stylo subulato obscure sulcato circiter 12 mm. longo inferne ut ovario sericeo superne glabro; capsulis depresso-subglobosis, 10-15 mm. longis, paullo latioribus, inconspicue sericeo-puberulis, primum ad medium vel fere ad basim loculicide denique perfecte septicide dehiscentibus, epicarpio tenui, endocarpio duro, basi styli persistente fisso, seminibus ut videtur circiter 3 pro loculo ellipsoideis circiter 3 mm. longis castaneis nitidis strophiolatis.

BRITISH NEW GUINEA: Central Division, Mt. Tafa, alt. 2300-2400 m., *Brass* 4041 (A, NY) (small slender weakly branched tree, in mossy-forest; leaves glossy on both sides), *Brass* 4888 (A, NY) (clean-boled tree, common in ridge forests; crown spreading, thin-foliaged; leaves darker and shining above, reddish in age), *Brass* 5059 (A, TYPE, NY), Sept. 17, 1933 (tree 12-14 m. high, common in substage of tall *sama* forest; leaves dark, with pale midrib and nerves; petals cream-colored).

Dubouzetia novoguineensis is quite distinct from the known New Caledonian species of the genus, being most suggestive of *D. elegans* Brongn. & Gris, according to Sprague's key (in Kew Bull. 1907: 126. 1907). The new species differs from *D. elegans* in its proportionately broader and apparently thinner leaf-blades, in having its flowers 4-8 on an obvious rachis rather than paired and subfasciculate, and in having its sepals somewhat larger at anthesis and its stamens more numerous.

Dubouzetia dentata sp. nov.

Arbor ad 25 m. alta sub fructu ubique infructescentiis exceptis glabra, ramulis gracilibus castaneis apicem versus angulatis inferne subteretibus; petiolis gracilibus canaliculatis 8-13 mm. longis; laminis chartaceis vel subcoriaceis in sicco fusco-olivaceis anguste ellipticis, 8-12.5 cm. longis, 2.5-4.5 cm. latis, basi obtusis, in apicem acutum gradatim angustatis, margine anguste recurvatis et dentibus apiculatis distantibus conspicue crenato-serratis, costa supra elevata subtus prominente, nervis lateralibus utrinsecus 6-9 leviter curvatis supra paullo subtus valde prominulis, rete venularum copioso utrinque prominulo; inflorescentiis sub fructu e ramulis infra folia orientibus vel interdum axillaribus, breviter racemosis, pedunculo brevi et rhachi 4-10 mm. longis demum glabratis, pedicellis sub fructu gracilibus 15-30 mm. longis puberulis vel glabratis; sepalis petalisque non visis; disco persistente 10-lobato, lobis carnosus oblongis circiter 1.2 mm. altis superne hirtellis; staminibus interdum subpersistentibus ut videtur circiter 30 ubique copiose hirtellis, filamentis gracilibus 5-7 mm. longis, antheris 1.7-2 mm. longis; capsulis 2-4 per inflorescentiam apicem rhachis versus ortis, obovoideis, maturitate 16-20 mm. longis et 12-15 mm. latis, basim versus angustatis, apice basi styli persistente fisso coronatis, cano-puberulis demum glabratis, primum parum loculicide denique perfecte septicide dehiscentibus, epicarpio tenui in sicco ruguloso, endocarpio osseo, seminibus paucis ellipsoideis 3-4 mm. longis atro-castaneis strophiolatis.

NETHERLANDS NEW GUINEA: Bele River, 18 km. northeast of Lake Habbema, alt.

2300 m., *Brass* 11251 (TYPE), Nov. 1938 (subsidiary tree 25 m. high in fagaceous forest of slopes; trunk 60 cm. diam.; bark fibrous, fissured).

Although the described collection lacks flowers, the characteristics of the fruit and the available persistent stamens leave no doubt that a species of *Dubouzetia* is represented. *Dubouzetia dentata* is of the general relationship of *D. novoguineensis* (described above), differing in its proportionately narrower and more sharply toothed leaf-blades, its much smaller anthers, and its obovoid fruits, which are gradually narrowed rather than rounded at base. The new species closely resembles the New Caledonian *D. elegans* Brongn. & Gris in leaf-shape and -texture but has the veinlets more obvious on both surfaces and the flowers more numerous; the anthers of *D. elegans* are about 3 mm. long, but apparently the fruits have not yet been described.

Sloanea L.

The Papuasian species of Elaeocarpaceae with loculicidally dehiscent fruits, a flattened staminiferous torus, and laterally dehiscent anthers not opening at the apex (*Sloanea* sens. lat.) were placed by Schlechter (in Bot. Jahrb. 54: 146-155. 1916) in three genera, *Echinocarpus* Bl., *Anoniodes* Schlechter, and *Antholoma* Labill. The biological validity of these genera can be appraised only by considering groups of this alliance in other parts of the world, including the proposed genera *Echinocarpus* and *Phoenicosperma*.

Echinocarpus Bl. (Bijdr. Fl. Ned. Ind. 56. 1825) was based on *E. Sigun* Bl. (loc. cit.), a Javan species with the following essential characters: inflorescences 1-flowered; petals differing from the sepals, toothed at apex; stamens with obvious filaments, awned at apex; ovary pubescent and obscurely muricate, the style moderately long; fruit copiously echinate; aril partial, covering apical portion of the seed only, irregular-margined. This concept is the basis of *Sloanea* § *Echinocarpus* F. v. Muell. ex K. Schum.

Phoenicosperma Miq. (in Ann. Mus. Bot. Lugd.-Bat. 2: 68. t. 3. 1865) was based on *P. javanicum* Miq. (loc. cit.), with the following essential characters: inflorescence few-flowered, racemose or paniculate; petals sepaloid in texture, shape, and size; stamens with distinct filaments and awned anthers; ovary velutinous, not muricate, the style moderately long; fruit thick-walled, closely pubescent but not echinate; seeds nearly completely enveloped in an aril, this eventually irregular-margined along one side (ex descr. et icon. Miq.) but probably covering young seeds completely except for the hilar area. *Sloanea* § *Phoenicospermum* K. Schum. is based upon this concept.

An examination of the Malaysian and continental Asiatic species of this alliance indicates that many of them fall into the concept typified by *Echinocarpus Sigun*, while others have the fruit non-echinate like that of *Phoenicosperma*; some have the petals sepaloid and others have them dentate, while many have the anthers essentially erostrate. These characters are found in diverse combinations, to such a degree that the limits

of *Echinospermum* and *Phoenicosperma*, as genera, are no longer useful. Further to complicate the picture, certain Australian species, such as *Sloanea Macbrydei* F. v. Muell. and *S. Woollsii* F. v. Muell., lack petals altogether.

There remains to be considered the possible separation of the Old World species of this alliance (as *Echinocarpus*) from *Sloanea*, which is based on *S. dentata* L., a West Indian species, pertaining to which the discussions of Urban (in Rep. Sp. Nov. 15: 321. 1918, and in Notizbl. Bot. Gart. Berlin 8: 27. 1921) are of importance. The American species of *Sloanea* are as diverse as their Old World relatives, having the fruit either echinate or not, the stamens with filaments of various lengths and with anthers either awned or not, and the flowers usually in open clusters but sometimes essentially fasciculate or even solitary. Petals are apparently lacking among the American species except in *S. jamaicensis* Hook. (Ic. Pl. 7: pl. 693-696. 1844). In view of this diversity, no single character nor any combination of characters will serve to separate the New and Old World species into two different genera. This is the prevailing viewpoint, adopted by K. Schumann (in E. & P. Nat. Pfl. III. 6: 5. 1890). However, Schumann's division of *Sloanea* into three sections, § *Eusloanea*, § *Echinocarpus*, and § *Phoenicospermum*, does not seem adequate, the genus being far more complex than such a division suggests. It is probable that a monographer of the group will erect many more sections, each based upon a combination of characters. None of Schumann's sections, in the narrow sense, occurs in Papuasias.

Support for a comprehensive concept of *Sloanea* is indicated by the treatments of Baillon (Hist. Pl. 4: 190-191. 1873), Szyszylowicz (in Bot. Jahrb. 6: 454. 1885), Koorders & Valetton (Bijdr. Boom. Java 1: 235-240. 1894), F. M. Bailey (Queensl. Fl. 1: 159-160. 1899), Gagnepain (in Lecomte, Fl. Gén. Indo-Chine 1: 562-564. 1910), Rehder & Wilson (in Sargent, Pl. Wils. 2: 361-362. 1915), and the majority of other students who have considered the group.

Contrary opinions, however, are expressed by Bentham (in Jour. Linn. Soc. Bot. 5: Suppl. 2: 62-74. 1861), Bentham & Hooker (Gen. Pl. 1: 238-239. 1862, and 987. 1867), Masters (in Hook. f. Fl. Brit. Ind. 1: 399-400. 1874), and Schlechter (in Bot. Jahrb. 54: 146-154. 1916). Schlechter proposed to segregate the Old World *Echinocarpus* from the American *Sloanea* on the basis of the following characters: the flowers of *Echinocarpus* are solitary and those of *Sloanea* clustered; the stamens are more numerous in *Echinocarpus*; the style is entire in *Echinocarpus* and 3-5-parted in *Sloanea*; and the aril of the seeds in *Echinocarpus* is lacerated and in *Sloanea* entire. However, none of these characters is dependable, various combinations of them being found in both hemispheres.

While the generic value of *Antholoma* appears not to have been questioned, I am unable to separate this genus from *Sloanea*. It is, in fact, very closely related to the section of *Sloanea* which I describe below as § *Pachycarpaea*, while these two sections are comparatively remote from other Papuasian sections. Thus it is undesirable to retain *Antholoma* as a genus unless the concept of *Sloanea* is broken up into numerous genera,

perhaps a dozen or two, a course which seems unwise in view of the complicated and reticulate inter-specific relationships within the group.

The Papuanian species of *Sloanea* fall into four natural groups, which are designated as sections, as follows:

Petals essentially similar to sepals in texture, shape, and size, not dentate at apex; stamens with short scarcely differentiated filaments, the anthers with short obtuse or subacute apices, essentially erostrate; ovary muricate as well as pubescent, the processes often minute and hidden by tomentum at anthesis; style comparatively short, often subconical, eventually deeply divided; seeds nearly completely enveloped by the aril.

Inflorescence racemose, several- or many-flowered, usually axillary, sometimes terminal on short branchlets and with the lower flowers solitary in leaf-axils; stamens all fertile; ovary muricate with obtuse or acute non-plumose processes; fruit copiously echinate with stiff sharp persistent non-irritant spines; aril extending nearly to the hilum, irregular- or subentire-margined. § *Anoniodes*.

Inflorescence axillary, 1-flowered, the peduncle and pedicel subcontinuous, articulate; fertile stamens surrounded by numerous linear staminodes; ovary muricate with stout hair-like processes which are copiously plumose distally; fruit covered with stiff slender plumose irritant spines, these at length more or less caducous, leaving the fruit-surface setose with smaller simple hairs or at length glabrous and finely pitted (pits indicating attachment of irritant spines); aril essentially complete except for the hilar scar. § *Cnidocarpaea*.

Petals differing from sepals in texture, shape, and size, dentate at apex; stamens all fertile, with obvious filaments and long-awned anthers; ovary velutinous or tomentellous with simple hairs, not muricate; style elongate, subulate, subentire or at length apically divided; fruit smooth, velutinous or tomentellous, not echinate, at length subglabrescent but then not pitted; aril partial, covering the apical portion of the seed and extending downward along one side nearly to the hilum.

Inflorescence short-racemose, few- or rarely 1-flowered; petals 4-6, rarely more, essentially equal in width, not plicate, free or very rarely subconnate; aril thick and waxy even when dried, the lateral flange linear-oblong, very gradually tapering. § *Pachycarpaea*.

Inflorescence usually 1-flowered (in Papuanian species), the peduncle and pedicel subcontinuous and obscurely articulate; petals plicate distally, connate into a corolla, rarely free and 2-4 in number (equal in width if 2, of diverse widths if 3 or 4); aril thin and papyraceous when dried, the lateral flange essentially triangular, abruptly tapering. § *Antholoma*.

Because of the transfer to *Sloanea* of the species of this alliance proposed by Schlechter and other students, the nomenclature of the Papuanian species is inevitably somewhat complicated. Therefore I list all the known species of the region, although material of some of them is not available. Seventeen species of *Sloanea*, most of which were proposed under other genera, are thus far described from Papuasias, to which number I add 12 new species below.

§ ANONIODES

Sloanea § *Anoniodes* (Schlechter) comb. nov.

Anoniodes Schlechter in Bot. Jahrb. 54: 149. 1916.

In founding *Anoniodes* upon nine endemic New Guinean species, Schlechter contrasts it with *Echinocarpus*, from which it is said to differ in having its inflorescences racemose rather than 1-flowered, its petals sepaloid, its stamens differently shaped and with a short scarcely differentiated filament, and its style shorter. Although these characters are

indeed noteworthy, they hardly seem of generic value in this complex group, as discussed above. No genotype was designated for *Anoniodes*, an oversight of little consequence, but in order to clarify any future discussion I should like to designate as the lectotype of § *Anoniodes* a well-known species of which ample material is available, *Sloanea Nymanii* K. Schum.

The differences between § *Anoniodes* and the other Papuanian sections are noted in the above key. From § *Echinocarpus*, § *Anoniodes* differs in its sepaloïd petals, short filaments and essentially erostrate anthers, and its nearly complete rather than apical aril. From § *Phoenicospermum*, § *Anoniodes* differs in its short filaments and essentially erostrate anthers, its muricate ovary, and its copiously echinate rather than smooth capsules.

The only New Guinean species described since 1916 which is referable to § *Anoniodes* is *S. sogerensis* Bak. f., discussed below as the acceptable binomial for *Anoniodes sterculiacea* Schlechter. With the addition of the five species herewith described as new, the section is now composed of 14 species.

Sloanea (§ *Anoniodes*) *Nymanii* K. Schum. in K. Schum. & Lauterb. Nachtr. Fl. Deutsch. Schutzgeb. Südsee 314. 1905; Bak. f. in Jour. Bot. 61: Suppl. 5. 1923.
Anoniodes Nymanii Schlechter in Bot. Jahrb. 54: 150. 1916.

NORTHEASTERN NEW GUINEA: Morobe District, Sattelberg, alt. 900–1000 m., *Clemens* 501 (tree 15–18 m. high; seeds scarlet), *Clemens* 1973 (tree 15–18 m. high, along forest trail); in den Wäldern oberhalb der Kaulo-Etappe, alt. about 1000 m., *Schlechter* 17189 (UC) [det. Schlechter]. BRITISH NEW GUINEA: Central Division, Bella Vista, alt. 1450 m., *Brass* 5456 (A, NY) (profusely flowering tree 20 m. high, in forest below oak formations; leaves pale, with whitish nerves; flowers cream-colored; seeds red).

Clemens 501 and 1973, both in fruit, are from the type locality. *Brass* 5456 also bears fruit and has mature inflorescences. Neither the fully mature flowers nor the fruits appear to have been described, and therefore the following notes seem desirable:

Inflorescences axillary or terminal on short branchlets, at maturity often up to 11 cm. long and 10–20-flowered, the lower flowers subtended by reduced leaves; pedicels at anthesis 10–17 mm. long, to 20 mm. long in fruit; sepals 4, up to 6×4 mm.; petals 4, resembling the sepals or slightly longer; torus about 2.5 mm. in diameter, the stamens 3- or 4-seriate, 50–55 (*Brass* 5456) to about 86 (*Schlechter* 17189), 2.5–3 mm. long, the filaments inconspicuous; ovary subglobose, hispid-pilose and densely muricate, the stylar column conical, stout, 1–1.3 mm. long, deeply 3- or 4-divided, the locules 3 or 4 (probably rarely 2), each 6-ovulate; capsule ellipsoid, at maturity 17–28 mm. long and 13–23 mm. broad before dehiscence, 3- or 4- or rarely 2-valved, the pericarp woody, 2–3 mm. thick, closely tomentellous-puberulent, densely echinate, the spines conical, 2–4 mm. long, glabrescent distally; seeds few or often only 1 per capsule, oblong-ellipsoid, 10–17 mm. long, 5–8 mm. broad, nearly completely covered by the aril, this undulate- or subentire-margined near the hilum.

Sloanea (§ *Anoniodes*) *glabra* (Schlechter) comb. nov.

Anoniodes glabra Schlechter in Bot. Jahrb. 54: 150. 1916.

Reported only from the type collection, *Ledermann* 9107, "Im dichten Höhenwalde auf dem Etappenberg, ca. 850 m.," Northeastern New Guinea.

Sloanea (§ *Anoniodes*) *aculeata* sp. nov.

Arbor ad 25 m. alta, ramulis robustis subteretibus rugulosis apicem versus sub fructu cano-puberulis demum subglabratibus; petiolis gracilibus subteretibus 8–25 mm. longis ut ramulis puberulis glabrescentibusque; laminis coriaceis in sicco fuscis elliptico- vel paullo obovato-oblongis, (5–)8–13 cm. longis, (2.5–)3.5–7 cm. latis, basi anguste subcordatis vel truncatis et inconspicue quinquenerviis, apice acutis et interdum cuspidatis vel rotundatis apiculo parvo ornatis, margine inconspicue crenatis, supra costa interdum puberula excepta glabris, subtus primo nervis venulisque molliter cano-hirtellis demum glabrescentibus, costa supra impressa vel in sulculo leviter elevata subtus prominente, nervis lateralibus utrinsecus 4–7 erecto-patentibus supra leviter impressis subtus valde elevatis, rete venularum intricato supra paullo subtus saepe valde prominulo; ramulis ut videtur in inflorescentiam terminalem transeuntibus, rhachi ramulis simili ad 6 cm. longa saepe brevior ut videtur pluriflora; fructibus paucis saepe in axillis foliorum apicem ramulorum versus solitariis, pedicellis sub fructu robustis 3–5.5 cm. longis puberulis glabrescentibusque; capsulis subgloboso-ellipsoideis maturitate 3–4 cm. longis paullo angustioribus, dense puberulis atque spinis crassis subulatis 8–15 mm. longis puberulis copiose ornatis, demum basibus spinarum irregulariter tuberculatis, 4- vel raro 5-valvatis; stylo crasso subulato ad 15 mm. longo mox caduco vel basi subpersistente cum valvis fisso; pericarpio lignoso spinis exceptis basim versus circiter 10 mm. superne 4–5 mm. crasso; seminibus in quoque loculo ut videtur circiter 4 ellipsoideis, 9–14 mm. longis, 5–8 mm. latis, fere totis arillo hilum versus sinuato-marginato arcte oclulis, arillo demum hinc inde caduco, testa glauco-nigrescente.

NETHERLANDS NEW GUINEA: 2 km. southwest of Bernhard Camp, Idenburg River, alt. 850 m., *Brass & Versteegh 13529* (TYPE), Apr. 1, 1939 (tree 25 m. high, frequent in primary rain-forest on a ridge; trunk 58 cm. diam.; crown not wide-spreading; bark 16 mm. thick, gray, shallowly fissured; wood red-brown; fruits yellow-brown); 6 km. southwest of Bernhard Camp, alt. 1200 m., *Brass & Versteegh 13104* (tree 21 m. high, rare in primary forest on a ridge; trunk 44 cm. diam.; crown fairly small; bark 6 mm. thick, brown, scaly, fairly rough; sap-wood white; heart-wood red; fruits red).

The specimen indicated as the type bears fully mature fruits and has the leaves essentially glabrous, while no. 13104 has younger fruits and the leaves still pubescent on the nerves and veinlets beneath. The closest relative of *S. aculeata* is probably *S. glabra* (Schlechter) A. C. Sm., which is more completely glabrous in habit and has longer petioles and a larger 3-valved fruit with fewer seeds.

Sloanea (§ *Anoniodes*) *Pullei* sp. nov.

Arbor ad 28 m. alta, ramulis robustis subteretibus apicem versus 5–10 mm. diametro mox glabris; stipulis parvis 1–2 cm. diametro foliaceis sessilibus basi cordatis mox caducis; petiolis crassis subteretibus (2.5–)3–8 cm. longis primo puberulis glabrescentibus; laminis chartaceo-coriaceis siccitate fusciscentibus late oblongo-ellipticis, (12–)17–33 cm. longis, (7–)10–20 cm. latis, basi rotundato-truncatis vel leviter cordatis et 7-nerviis, apice obtusis vel rotundatis et minute mucronulato-cuspidatis, margine irregulariter spinuloso-crenulatis, utrinque glabris vel nervis evanescenter puberulis, costa valida supra elevata subtus prominente, nervis e basi orientibus utrinsecus 3 rectis haud conspicuis, nervis laterali-

bus e costa utrinsecus 6-9 adscendentibus supra elevatis subtus prominentibus, eis basim versus nervulos conspicuos inferne emittentibus, rete venularum copioso utrinque plus minusve prominulo; inflorescentiis racemosis axillaribus 11-19 (sub fructu ad 23) cm. longis 15-20-floris, pedunculo conspicuo (rhachem subaequali) et rhachi leviter angulatis sub anthesi cum bracteis pedicellisque dense tomentello-puberulis sub fructu incrassatis et glabrescentibus, bracteis lanceolatis 4-5 mm. longis mox caducis, pedicellis sub anthesi gracilibus 12-15 mm. longis; sepalis 4 papyraceo-subcoriaceis elliptico-oblongis, 7-8 mm. longis, 3.5-4 mm. latis, subacutis, utrinque cano-puberulo-tomentellis; petalis 4 sepalis similibus sed ad 4.5 mm. latis; toro ad 3 mm. diametro; staminibus circiter 50 plerumque 3-seriatis circiter 3.5 mm. longis, filamentis carnis glabris 0.5-1 mm. longis, antheris curvatis dorso obscure hispidulis apiculo glabro circiter 1 mm. longo exeuntibus; ovario ovoideo 4-angulato 4-loculari pilis stramineis circiter 0.3 mm. longis dense hispido atque obscurissime muricato, loculis 10-ovulatis, stylo crasso conico circiter 1.5 mm. longo superne glabro apice obscure 4-fido; pedicellis sub fructu valde incrassatis ad 2 cm. longis; capsulis maturis ellipsoideis 4-5 cm. longis paullo angustioribus, persistenter cano-puberulis atque spinis subulatis ad 10 mm. longis (mox interruptis) ornatis, demum basibus spinarum tuberculatis, 4- vel raro 3-valvatis; pericarpio lignoso 9-10 mm. crasso; seminibus in quoque loculo ut videtur 4-6 ellipsoideis, 12-15 mm. longis, 5-7 mm. latis, fere totis arillo hilum versus subintegro-marginato ocllusis.

NETHERLANDS NEW GUINEA: Mt. Perameles, alt. 1100 m., *Pulle 519* (TYPE), Dec. 1, 1912; 4 km. southwest of Bernhard Camp, Idenburg River, *Brass & Versteegh 13135* (tree 28 m. high, occasional in primary rain-forest on the slope of a ridge; trunk 44 cm. diam.; crown not wide-spreading; bark 8 mm. thick, gray, fairly rough; sap-wood light yellow; heart-wood red-brown; fruits light brown).

The specimen designated as the type bears flowers and has been indicated by Dr. O. C. Schmidt to be a new species, with the specific epithet selected above; apparently Schmidt's binomial has not been published. Mt. Perameles lies to the south of Mt. Wilhelmina and consequently on the other side of the main range from the Idenburg River locality. The Brass and Versteegh specimen bears fruits and in foliage is essentially identical with the type.

Sloanea Pullei appears to be most closely related to *S. glabra* (Schlechter) A. C. Sm. and *S. aculeata* (above described), from both of which its much larger leaves and its elongate axillary inflorescences immediately distinguish it.

Sloanea (§ *Anoniodes*) *micrantha* nom. nov.

Anoniodes parviflora Schlechter in Bot. Jahrb. 54: 151. 1916; non *Sloanea parviflora* Planch. ex Benth., 1861.

Known only from the original collection, *Ledermann 10369*, "Im lichten Bergwalde auf dem Lordberg, ca. 1000 m.," Northeastern New Guinea.

Sloanea (§ *Anoniodes*) *brachystyla* (Schlechter) comb. nov.

Anoniodes brachystyla Schlechter in Bot. Jahrb. 54: 151. 1916.

Reported only from the type collection, *Ledermann 10356*, "Im montanen Walde auf dem Lordberg, ca. 1000 m.," Northeastern New Guinea.

Sloanea (§ *Anoniodes*) *Schumanni* Warb. in Bot. Jahrb. 13: 372. 1891; K. Schum. & Lauterb. Fl. Deutsch. Schutzgeb. Südsee 433 (as *S. Schumannii*). 1901; Bak. f. in Jour. Bot. 61: Suppl. 5. 1923.

Anoniodes Schumannii (sic) Schlechter in Bot. Jahrb. 54: 151. 1916.

The type was collected by Warburg (presumably no. 20023) near Finschhafen, North-eastern New Guinea. Two other collections from the same general region are cited by Schlechter, and Baker lists a collection from Sogere, British New Guinea.

Sloanea (§ *Anoniodes*) *speciosa* sp. nov.

Arbor, ramulis gracilibus subangulatis apicem versus 2–3 mm. diametro crispato-hispidulis mox glabratiss; stipulis inconspicuis lanceolatis ad 1 cm. longis interdum in laminam minutam expansis mox caducis; petiolis gracilibus subteretibus 1.5–4 cm. longis ut ramulis hispidulis et glabrescentibus; laminis papyraceo-chartaceis oblongo-ellipticis, maturis 10–16 cm. longis et 4.5–7 cm. latis, basi anguste subcordatis vel rotundato-truncatis et inconspicue 5-nerviis, apice acutis vel breviter mucronulato-cuspidatis, margine dentibus 1 vel 2 per centimetrum callosocrenulatis, supra costa interdum puberulis, subtus costa nervisque laxe crispato-pilosis, ceterum glabris, demum omnino glabrescentibus, costa supra subplana subtus prominente, nervis lateralibus e costa utrinsecus 5–8 rectis adscendentibus supra impressis subtus valde elevatis, rete venularum intricato utrinque prominulo; inflorescentiis racemosis axillaribus vel terminalibus (ramulis in inflorescentiam transeuntibus, floribus interdum in axillis foliorum solitariis) 8–12 cm. longis plerumque 6–12-floris, pedunculo conspicuo et rhachi mox glabratiss, bracteis linearibus hirtellis 1–2 cm. longis interdum foliaceis demum deciduis; pedicellis gracilibus sub anthesi 3–5 cm. longis copiose et pallide tomentellis; sepalis 4 papyraceis late ovato-ellipticis, 12–15 mm. longis, 7–9 mm. latis, subacutis, utrinque dense tomentello-puberulis; petalis 4 textura et indumento sepalis similibus, intus basim versus subglabratiss, lanceolato-oblongis, 16–18 mm. longis, 5–7 mm. latis, subacutis; toro circiter 5 mm. diametro; staminibus circiter 110 valde falcatis 4- vel 5-seriatis 6–7 mm. longis, filamentis carnosiss complanatis 1.5–2 mm. longis, antheris dorso sericeo-hispidulis apiculo acuto glabro 1–1.5 mm. longo exeuntibus; ovario ovoideo 4-loculari pilis simplicibus stramineis circiter 2 mm. longis dense hispido atque processibus circiter 0.15 mm. longis occultis obscure muricato, loculis circiter 16-ovulatis, stylo carnososo subulato circiter 5 mm. longo leviter sulcato apice obscure 4-fido.

NORTHEASTERN NEW GUINEA: Morobe District, Quembung, alt. about 750 m., *Clemens* 1189 (TYPE), Dec. 12, 1935.

From *S. Schumannii* Warb., apparently its closest ally, *S. speciosa* is readily distinguished by the sparse rather than copious indument of its petioles and leaf-nerves, its smaller leaf-blades, its sometimes terminal inflorescence with the flowers often solitary in leaf-axils, and its much longer pedicels. Mature floral dimensions have not been given for *S. Schumannii*, but the bud is presumably about the size of that of the new species.

Sloanea (§ *Anoniodes*) *sogerensis* Bak. f. in Jour. Bot. 61: Suppl. 6. 1923.

Anoniodes sterculiacea Schlechter in Bot. Jahrb. 54: 152. 1916; O. C. Schmidt in Jour. Arnold Arb. 10: 237. 1929; non *Sloanea sterculiacea* Rehder & Wilson, 1915.

NETHERLANDS NEW GUINEA: 6 km. southwest of Bernhard Camp, Idenburg River, alt. 1250 m., *Brass & Versteegh* 12529 (tree 25 m. high, occasional in primary forest on a ridge; trunk 50 cm. diam.; crown not wide-spreading; bark 8 mm. thick, gray, fairly smooth; sap-wood light rose; heart-wood red-brown; fruits brown-yellow). NORTHEASTERN NEW GUINEA: Morobe District: Sattelberg, alt. 750–1050 m., *Clemens* 1854

(large tree, in forest; trunk more than 1 m. diam.; fruit yellow-gray), *Clemens* 1899 (tree, in forested hills; trunk 45–60 cm. diam.; fruit gray-green), *Clemens* 3103; Bulung River, alt. about 900 m., *Clemens* 5334; Boana, alt. 750–1350 m., *Clemens* 41805 (large tree; seeds scarlet). BRITISH NEW GUINEA: Central Division: Iawarere, alt. about 350 m., *Brass* 691 (large straight-boled tree, with brittle corky bark and pale hard wood); Mafulu, alt. 1250 m., *Brass* 5210 (A, NY) (large tree, in tall forest of mountain-slopes; crown dense, thickly branched; fruit pale yellow, the seeds orange-red).

Anoniodes sterculiacea was based on *Ledermann* 9581, "In dichtem Höhenwald auf dem Etappenberge, ca. 850 m.," Northeastern New Guinea; the specific epithet is not available in *Sloanea*. *Sloanea sogerensis* is typified by four collections of Forbes, from Sogere, Central Division, British New Guinea. A comparison of the two original descriptions indicates that the same species was under consideration, characterized by large and subpersistent stipules, large leaf-blades which are persistently hirtellous beneath, and elongate inflorescences. *Sloanea sogerensis* is described as having longer petioles and pedicels than *Anoniodes sterculiacea*, but in the series of specimens cited above I find the petioles to vary from 2 to 8 cm. and the pedicels from 1 to 3.5 cm. in length, indicating that these characters are variable. The racemes are often elongated to 30 cm. in fruit. The flowers are predominantly 4-merous (sepals said to be commonly 3 in *Anoniodes sterculiacea*), the stamens about 200 and 5- or 6-seriate, the capsule at maturity subglobose, 3–4 cm. in diameter, usually 4-valved, copiously covered with spines 6–12 mm. long, and the seeds are few, often only 1 per locule, large (up to 18×9 mm.), and nearly completely arillate.

Sloanea (§ *Anoniodes*) *oxyacantha* sp. nov.

Arbor ad 17 m. alta, ramulis subteretibus apicem versus 3–5 mm. diametro dense brunneo-tomentello-puberulis inferne demum subglabrescentibus; stipulis saepe subpersistentibus textura foliaceis suborbicularibus sessilibus basi cordatis 6–12 (–25) mm. diametro; petiolis robustis subteretibus ut ramulis tomentellis (1.5–)3–6.5 cm. longis; laminis chartaceo-coriaceis in sicco fuscis deltoideo-ovatis vel -ellipticis, (8–)12–24 cm. longis, (5–)7–13.5 cm. latis, basi profunde cordatis et 7- vel raro 5-nerviis, apice acutis et callosio-apiculatis, margine dentibus 1 vel 2 per centimetrum callosio-apiculatis crenulatis, supra costa nervisque copiose hispidulis et rete venularum interdum pilifero exceptis glabris, subtus molliter et breviter hirtellis, costa supra leviter subtus valde prominente, nervis lateralibus e costa utrinsecus 6–9 erecto-patentibus supra leviter elevatis subtus prominentibus, eis basim versus nervulos paucos inferne emittentibus, rete venularum intricato utrinque prominulo; inflorescentiis sub fructu axillaribus racemosis 3–8 cm. longis, pedunculo subnullo, rhachi crassa subtereti pedicellis ut ramulis puberulis demum subglabrescentibus; fructibus paucis, pedicellis 11–17 mm. longis; capsulis subglobosis spinis exclusis ad 1 cm. diametro, dense puberulis atque spinis crassis subulatis 8–12 mm. longis copiose obtectis, ut videtur interdum 2-valvatis (apertis non visis), stylo brevi inconspicuo coronatis, pericarpio 2–3 mm. crasso; seminibus ut videtur interdum solitariis, fere totis arillo occlusis.

NETHERLANDS NEW GUINEA: 15 km. southwest of Bernhard Camp, Idenburg River, alt. 1700 m., *Brass & Versteegh* 11924 (tree 17 m. high, frequent in rain-forest of upper slopes; trunk 39 cm. diam.; crown not wide-spreading; bark 5 mm. thick, brown; wood

rose-colored; fruits brown-yellow), *Brass* 12045 (TYPE), Jan. 1939 (tree 4 m. high, one specimen seen in undergrowth of a rain-forest gully).

Although known only from the two cited fruiting specimens, *S. oxyacantha* is obviously most closely related to *S. sogrensis* Bak. f., which it resembles in its stipules and in the texture, shape, pubescence, and venation of its leaf-blades. The leaf-blades of the new species are inclined to be more deltoid-ovate than elliptic-ovate in shape, while in fruit the two species are quite different. *Sloanea oxyacantha* has the inflorescence much more compact and short-pedunculate, while the capsules are short-pedicellate and much smaller, with correspondingly fewer spines.

Sloanea (§ *Anoniodes*) *Ledermannii* nom. nov.

Anoniodes rufa Schlechter in Bot. Jahrb. 54: 152. f. 9, H-M. 1916; non *Sloanea rufa* Planch. ex Benth., 1861.

Recorded only from the type collection, *Ledermann* 12616, "Im Gebirgswalde bei dem Lager 'Felsspitze' ca. 1400-1500 m.," Northeastern New Guinea.

Sloanea (§ *Anoniodes*) *pulchra* (Schlechter) comb. nov.

Anoniodes pulchra Schlechter in Bot. Jahrb. 54: 153. f. 9, A-G. 1916; Lane-Poole, Rep. For. Res. Papua 110. 1925; White & Francis in Proc. Roy. Soc. Queensl. 39: 64. 1928.

The type was collected by Ledermann (no. 9267), "In dichtem Höhenwalde auf dem Etappenberg, ca. 850 m.," Northeastern New Guinea. Lane-Poole and White and Francis refer here a collection by Lane-Poole from the Finschhafen district.

Sloanea (§ *Anoniodes*) *Clemensiae* sp. nov.

Arbor, ramulis hornotinis leviter angulatis 3-4 mm. diametro dense fulvo-villosis, annotinis subglabratis striatis fusco-cinereis; petiolis validis ut ramulis juvenilibus dense villosis subteretibus 12-17 mm. longis; laminis chartaceis in sicco atro-brunneis late ellipticis, (7-)10-15 cm. longis, (5-)7-10 cm. latis, basi rotundatis vel anguste subcordatis et inconspicue 5-nerviis, apice acutis et callosio-apiculatis, margine dentibus 1 vel 2 per centimetrum inconspicue callosio-crenulatis, supra costa nervisque fulvo-hispidulis exceptis glabris, subtus pilis pallidis mollibus persistenter hirtellis, costa supra leviter elevata subtus prominente, nervis lateralibus e costa utrinsecus 4-6 erecto-patentibus supra subplanis subtus valde elevatis, rete venularum intricato utrinque prominulo; inflorescentiis axillaribus vel terminalibus (ramulis in inflorescentiam gradatim transeuntibus, floribus inferne in axillis foliorum solitariis) 9-12 cm. longis 8-15-floris, rhachi pedicellisque ut ramulis dense villosis, bracteis lineariibus villosis ad 15 mm. longis vel foliaceis mox caducis, pedicellis sub anthesi 4-4.5 cm. longis; floribus paullo ante anthesin solis visis; sepalis 4 subcoriaceis ovatis circiter 10×7 mm., acutis, extus hispidulo-tomentellis, intus arcte cano-sericeis; petalis sepalis subsimilibus, ovato-ellipticis, circiter 9×6 mm., subacutis, extus tomento denso sericeo obtectis, intus arcte sericeis; toro carnoso circiter 6 mm. diametro pilis stramineis circiter 1 mm. longis dense hispido; staminibus circiter 90 pluriseriatis 6-7 mm. longis, filamentis carnosissimis complanatis 0.5-1.3 mm. longis, antheris oblongo-falcatis dorso pilis stramineis circiter 0.5 mm. longis dense hispido-sericeis apiculo carnoso obtuso 1 mm. longo exeuntibus; ovario 4-loculari pilis stramineis simplicibus 1.5-2 mm. longis dense hispidulo atque processibus circiter 0.25 mm. longis occultis copiose muricato, loculis 14-ovulatis, stylo carnoso conico 4-sulcato circiter 3 mm. longo basi tomento occulto apice

4-fido; capsulis maturis ellipsoideis 2.5–3.5 cm. longis, persistenter strigulosis atque spinis subulatis ad 10 mm. longis puberulis ornatis, ut videtur 4-valvatis, pericarpio lignoso 2–3 mm. crasso, seminibus non visis.

NORTHEASTERN NEW GUINEA: Morobe District, Ogeramnang, alt. about 1700 m., *Clemens* 4900 (TYPE), Jan. 9, 1937.

Sloanea Clemensiae is most closely related to *S. pulchra* (Schlechter) A. C. Sm., from which it differs in its shorter-petiolate leaf-blades, which are glabrous rather than velutinous above, its longer pedicels, its probably smaller flowers, and its 4- rather than 5-merous perianth and ovary (probably not a very important character). In the terminal inflorescences of *S. Clemensiae* the branchlets pass imperceptibly into the rachis, and the lower flowers are solitary in leaf-axils. This flowering habit occurs in some other species of § *Anoniodes* and indicates that it is not of primary consequence whether the flowers are solitary and axillary or aggregated into racemes.

Sloanea (§ *Anoniodes*) *velutina* (Schlechter) comb. nov.

Anoniodes velutina Schlechter in Bot. Jahrb. 54: 154. 1916.

Known only from the original collection, *Ledermann* 12014, "In bemoostem Gebirgswalde auf dem Schraderberge, ca. 2070 m.," Northeastern New Guinea.

§ CNIDOCARPAEA

Sloanea § *Cnidocarpaea* sect. nov.

Sectio *Sloaneae* petalis textura et apice sepalis similibus, staminibus staminodiisque numerosissimis (circiter 250–275), staminodiis linearibus, staminibus apiculo brevi crasso exeuntibus, ovario setuloso et processibus plumosis muricato, fructibus spinas numerosas breves urentes gerentibus, seminibus arillo omnino obtectis distinguitur. Arborea, inflorescentiis axillaribus 1-floris, pedunculo et pedicello subcontinuis articulatis; petalis quam sepalis paulo longioribus vel subsimilibus subacutis; staminodiis circiter 90–100, staminibus intra staminodia circiter 160–180, filamentis brevibus; ovario 3- vel 4-loculari, loculis 10–20 (vel ultra?) -ovulatis, stylo crasso conico brevi profunde fisso; capsulis magnis 3- vel 4-valvatis, valvis lignosis densissime et breviter plumoso-spinosis atque minute setulosis; seminibus 6–20 in quoque loculo, arillo praeter hili cicatricem omnino occlusis.

The sectional name is compounded from the Greek words for nettle and fruit, referring to the fact that the capsules are covered by irritant plumose hair-like bristles, which are readily caducous and extremely unpleasant to the touch. To the two already known species of New Guinea which are referable to this section, I add one new species below. *Sloanea Brassii* (O. C. Schmidt) A. C. Sm. is herewith designated as the type species of § *Cnidocarpaea*.

The new section is very distinct and is readily distinguished from the other Papuan sections as pointed out in the key above. In having its numerous stamens surrounded by sterile staminodial organs and in its fruit-indument, § *Cnidocarpaea* is unlike the other described sections of *Sloanea*. In the general characters of its petals, stamens, and aril, § *Cnidocarpaea* resembles § *Anoniodes*, while its thick-walled capsules in texture resemble those of § *Pachycarpaea* and § *Antholoma*. The new

section differs obviously from § *Echinocarpus* in characters pertaining to its petals, stamens, staminodes, ovary- and fruit-indument, and aril; from § *Phoenicospermum* it differs in its simple inflorescence, its stamens, staminodes, and ovary- and fruit-covering.

Sloanea (§ *Cnidocarpacea*) *Brassii* (O. C. Schmidt) comb. nov.

Sloanea paradisearum sensu F. M. Bailey in Queensl. Agr. Jour. 22: 147. pl. 24. 1909; Lane-Poole, Rep. For. Res. Papua 111 (*S. paradisiarum*). 1925; non F. v. Muell.

Echinocarpus Brassii O. C. Schmidt in Jour. Arnold Arb. 10: 79, 237. 1929.

BRITISH NEW GUINEA: Bisiatabu, in foothill forest, alt. 450 m., *Brass* 619 (TYPE COLL.) (handsome buttressed tree 18 m. high; bark thin, rough, brown; wood pale; sepals pink; petals white). NETHERLANDS NEW GUINEA: Bernhard Camp, Idenburg River, alt. 75 m., *Brass & Versteegh* 13551 (tree 21 m. high, occasional in primary rain-forest on lower mountain-slopes; trunk 43 cm. diam.; crown fairly small; bark 6 mm. thick, fairly rough; wood red-brown; fruits red), *Brass & Versteegh* 14002 (tree 24 m. high, rare in primary rain-forest on lower mountain-slopes; trunk 48 cm. diam.; crown not wide-spreading; bark 14 mm. thick, black; sap-wood brown; heart-wood black; flowers white); ? *Hollandia, Neth. Ind. For. Serv.* 28927 [sterile].

The cited specimens are very uniform and offer ample material for study. Although the original description is in general adequate, several important features are omitted, making desirable the following amplification:

Leaves more or less persistently puberulent on petiole and principal nerves of lower surface; petioles 15–40(–65?) mm. long; leaf-blades papyraceous or chartaceous, dark brown when dried, obovate-elliptic, (7–)12–23 cm. long, (4–)6–12 cm. broad, narrowly rounded or subcordate at base, obtuse-cuspidate at apex, undulate-crenate at margin; inflorescence axillary, 1-flowered, the peduncle and pedicel subcontinuous, obscurely jointed, 15–25 mm. long; sepals 4 (or sometimes 3 by fusion of 2), 11–12 mm. long, 8–10 mm. broad, soon glabrous without, short-sericeous within; petals 4, papyraceous-subcoriaceous, 14–17 mm. long, 7–8 mm. broad; torus about 5 mm. in diameter, copiously hispidulous; stamens and staminodes very numerous (about 250–260), 5–6-seriate, 6–8 mm. long; staminodes about 90, linear-oblong, composed of a puberulent filament about 3 mm. long and a sterile glabrous body, sometimes lightly coherent laterally; stamens about 165, inside the staminodes, the filaments about 2 mm. long, glabrous or sparsely sericeous above, the anthers subacute, sericeous on both surfaces; ovary oblong-ellipsoid, 3- or 4-locular, setose with simple hairs about 0.6 mm. long and also copiously beset with shorter stouter hair-like processes, these 0.3–0.4 mm. long and copiously plumose toward apex; locules 10–14-ovulate; style subconical, 3–6 mm. long, deeply 4-fid, glabrous distally; fruit solitary, the combined peduncle and pedicel (obscurely jointed) 3–4.5 cm. long, stout (4–6 mm. in diameter); capsules oblong-ellipsoid, 5–7.5 cm. long, 4–5.5 cm. broad, 3- or 4-valved, the valves 2.5–3.5 cm. broad at base; pericarp woody, 7–12 mm. thick, covered without by innumerable stiff slender crowded subclavate bristles, these about 2 mm. long, plumose, irritant, at length deciduous, leaving the fruit-surface densely setose with stiff simple hairs or at length glabrescent and copiously pitted; seeds 6–16 per locule, angular-ellipsoid, 12–16 mm. long, 5–8 mm. broad, obtuse at base, rounded at apex, the aril completely investing the seed except for the hilar scar.

In presenting a brief re-description of *S. paradisearum*, Bailey (loc. cit.)

apparently based it in part upon Mueller's description and in part upon a specimen collected by Mrs. H. P. Schlencker at Boku, British New Guinea. The illustration doubtless portrays the latter plant and seems referable to *S. Brassii* rather than to Mueller's species. Lane-Poole (loc. cit.) also seems to have described *S. Brassii*, stating that his plant is "a common tree with a wide range around the lower altitudes of Papua from the plain to 2,000 feet." The description of the petioles as " $\frac{1}{2}$ to $2\frac{1}{2}$ inches" and the leaf-blades as "undulate, . . . thin," indicates *S. Brassii* rather than *S. paradisearum*. Whether the latter species occurs beyond the Fly River basin remains to be ascertained.

Sloanea (§ *Cnidocarpaea*) *paradisearum* F. v. Muell. Pap. Pl. 1: 84. 1877; Schlechter in Bot. Jahrb. 54: 148. 1916.

BRITISH NEW GUINEA: Fly River, 528-mile Camp, alt. 80 m., *Brass* 6822 (large tree with spur-buttressed base, in canopy-layer of ridge-forest; crown spreading, rather open; leaves glabrous, shining, the nerves prominent; fruits covered with irritant red hairs).

Apparently the above-cited *Brass* specimen is only the second collection which may be accurately referred to *S. paradisearum*, which is based on a collection by D'Albertis, also from the upper Fly River. F. M. Bailey and Lane-Poole have referred to this species plants from the eastern part of British New Guinea, which I believe are better placed in *S. Brassii*, as discussed above. The flowers of *S. paradisearum* are apparently still unknown. *Brass* 6822 agrees closely with the original description of Mueller's species, but certain details are in need of amplification, as follows:

Leaves glabrous in fruiting specimens or with a few obscure weak hairs on the petiole and the costa of lower leaf-surface; petioles slender, 6-18(-25) mm. long [2-3 lines ex Mueller]; leaf-blades chartaceous-subcoriaceous, green when dried, oblong-elliptic, (9-)13-20 cm. long, (4-)5-9 cm. broad, broadly obtuse or narrowly rounded at base, narrowed to a short obtuse acumen at apex, obscurely undulate or subentire at margin; fruit solitary on thickened peduncles, the combined peduncle and pedicel (obscurely jointed) 5-7 mm. in diameter and 6-7 cm. long; capsules oblong-ellipsoid, up to 10 cm. long and 6 cm. broad, 3- or 4-valved, the valves 3-4 cm. broad at base; pericarp 8-12 mm. thick, with indument similar to that described above for *S. Brassii* but with the bristles about 3 mm. long; seed 2-ranked, closely crowded, 14-20 per locule, essentially identical with those described above for *S. Brassii*.

In the absence of flowering material, comparison of this species with *S. Brassii* cannot be complete, but I believe that both species may be maintained. In comparison, *S. paradisearum* has shorter petioles, leaf-blades which remain green in drying and are slightly thicker in texture, more completely glabrescent petioles and nerves of the lower leaf-surface, and longer-peduncled and larger capsules, which have proportionately narrower valves, slightly longer spines, and more numerous seeds.

Sloanea (§ *Cnidocarpaea*) *myriandra* sp. nov.

Arbor, ramulis apicem versus gracilibus (2-3 mm. diametro) angulatis dense et molliter hirtellis, vetustioribus purpurascens glabratis striatis;

foliis suboppositis vel alternatis, petiolis gracilibus subteretibus 13–30 (vel ultra?) mm. longis ut ramulis hirtellis, laminis tenuibus papyraceis in sicco viridibus late ellipticis, 10–25 cm. longis, 6.5–15 cm. latis, basi late obtusis vel subrotundatis, apice breviter et obtuse cuspidatis, margine inconspicue undulatis subintegrisve, supra costa nervisque crispato-hirtellis exceptis glabris vel hinc inde inconspicue pilosis, subtus pilis pallidis 0.3–0.5 mm. longis molliter hirtellis, costa supra leviter elevata subtus prominente, nervis lateralibus utrinsecus 7–10 erecto-patentibus supra valde prominulis subtus elevatis, rete venularum intricato utrinque paullo prominulo; inflorescentiis axillaribus 1-floris, pedunculo (8–15 mm. longo) et pedicello (circiter 10 mm. longo crassiore) articulatis gracilibus dense puberulo-tomentellis; sepalis 4 (interdum 2 connatis) papyraceis ovato-ellipticis, 13–15 mm. longis, 7–10 mm. latis, subacutis, extus pallide puberulo-tomentellis, intus minute sericeo-puberulis et basim versus glabrescentibus; petalis 4 vel 5 textura sepalis similibus, elliptico-oblongis, 13–16 mm. longis, 6–8 mm. latis, subacutis, utrinque sericeo-puberulis, intus basim versus glabrescentibus; toro circiter 5 mm. lato minute hispidulo; staminibus staminodiisque numerosissimis (250–275) 5- vel 6-seriatis 6–7 mm. longis valde falcatis imbricatis; staminodiis 90–100 lineari-oblongis stipite obscure hispidulo 3–4 mm. longo excepto glabris; staminibus 160–180, filamentis carnosis complanatis 1–2 mm. longis subglabris, antheris dorso sericeo-hispidulis apiculo subglabro subacuto 1–2 mm. longo exeuntibus; ovario ovoideo-ellipsoideo 4-loculari leviter sulcato, processibus cylindricis circiter 0.2 mm. longis apicem versus dense plumosis copiose muricato, atque pilis simplicibus 0.3–0.5 mm. longis minute et dense setuloso, ovarii pariete crasso, loculis 10–12-ovulatis, stylo crasso conico 3–5 mm. longo, apicem versus vel fere ad basim 4-partito, basi hispidulo superne glabro.

NORTHEASTERN NEW GUINEA: Morobe District, Sattelberg, alt. 1000–1200 m., *Clemens* 1048 (TYPE), Dec. 3, 1935.

This well-marked species is readily distinguished from its only close allies, *S. Brassii* (O. C. Schmidt) A. C. Sm. and *S. paradisearum* F. v. Muell., by its thin leaf-blades, which are soft-pilose beneath, and its copiously pubescent branchlets, petioles, peduncles, and pedicels. Its flowers closely resemble those of *S. Brassii* but have the stamens less copiously pubescent and the ovary-indument slightly closer.

§ PACHYCARPAEA

Sloanea § *Pachycarpaea* sect. nov.

Echinocarpus sensu Schlechter in Bot. Jahrb. 54: 146, quoad spec. novo-guin. 1916; non Bl.

Sectio *Sloaneae* petalis latis, antheris aristatis, fructibus arcte pubescentibus non echinatis, seminibus apice et uno latere arillatis distinguitur. Arbores, inflorescentiis axillaribus breviter racemosis paucifloris; petalis quam sepalis majoribus, apice latis dentatisque; staminibus numerosis (plerumque 50–125) pluriseriatis, filamentis distinctis, antheris arista subulata conspicua exeuntibus; ovario pilis simplicibus velutino vel tomentello, 3–5 (raro 2-)-loculari, loculis 16–28-ovulatis, stylo elongato; capsulis magnis 3–5 (raro 2-)-valvatis, valvis crassis lignosis extus velutinis vel tomentellis non echinatis demum subglabrescentibus; seminibus plerumque 6–16 in quoque loculo, arillo crasso apicem seminis obtegente atque uno latere fere ad hilum extenso.

The sectional name refers to the thick-walled fruit; the differences between § *Pachycarpaea* and the other sections occurring in Papuasias are pointed out in the key above. Four already described species from New Guinea are here placed in § *Pachycarpaea*, to which number I add three more, one of them from the Solomon Islands. Whether this section extends beyond Papuasias is yet to be decided. *Sloanea Forbesii* F. v. Muell. is herewith designated as the type species of § *Pachycarpaea*.

From § *Echinocarpus*, the new section differs in its non-muricate ovary, its closely pubescent but non-echinate fruit, and the lateral extension of its aril; in § *Echinocarpus* the aril appears to cover only the apical portion of the seed. The fruits of § *Pachycarpaea* are so entirely different that the Papuan species can hardly logically be placed in § *Echinocarpus*. The new section differs from § *Phoenicospermum* in the form of its inflorescence, its broadened dentate petals, and its aril; in § *Phoenicospermum* the aril is presumably nearly complete, as in § *Anoniodes*. Superficially the fruits of § *Pachycarpaea* and § *Phoenicospermum* are similar, but the characters of the petals and the aril amply differentiate the sections.

From the preceding paragraph it is seen that § *Pachycarpaea* is more suggestive of both § *Echinocarpus* and § *Phoenicospermum* than it is of the Papuan sections *Anoniodes* and *Cnidocarpaea*. Its closest relative, however, is § *Antholoma*.

Sloanea (§ *Pachycarpaea*) *papua* (Schlechter) comb. nov.

Echinocarpus papuanus Schlechter in Bot. Jahrb. 54: 148. 1916; White & Francis in Proc. Roy. Soc. Queensl. 39: 64. 1928.

NORTHEASTERN NEW GUINEA: Morobe District, alt. 750–2400 m., Sattelberg, *Clemens* 301 (tree 24–27 m. high, somewhat flanged at base, in hill-forest; trunk 30–60 cm. diam.; calyx cream-colored; petals pale green), *Clemens* 958 (tree 15–18 m. high, in marginal forest; trunk 30 cm. diam.); Yunzaing, *Clemens* 4100; Kaile to Sarawaket, *Clemens* 4924; vicinity of Wantoat, *Clemens* 11324 (tree, the trunk 30 cm. diam.; flowers pale greenish); Boana, *Clemens* 41551 (herb. Univ. Mich.), *Clemens* 41722 (large tree; trunk 45 cm. diam.; fruits dull yellow). NETHERLANDS NEW GUINEA: 6 km. southwest of Bernhard Camp, Idenburg River, alt. 1050 m., *Brass & Versteegh* 13109 (tree 32 m. high, occasional in primary forest on the slope of a ridge; trunk 51 cm. diam.; crown not wide-spreading; bark 12 mm. thick, brown; fruits red-brown).

The cited specimens appear to agree well with the original description of *Echinocarpus papuanus*, based on *Ledermann* 10315, "Im montanen Walde auf dem Lordberg, ca. 1000 m.," and the species has also been reported from Yunzaing by White and Francis. The specimens now available make desirable some amplification of the original description, as follows:

Petiole 1–3 cm. long; leaf-blades 8–19 cm. long, 4–11.5 cm. broad, glabrous but sometimes obscurely barbellate in axils of nerves beneath; inflorescences axillary, short-racemose, short-pedunculate, 2–4- or often only 1-flowered, the rachis to 3.5 cm. long but usually much shorter, the pedicels 8–25 mm. long; flowers either 4- or 5-merous; sepals 9–13 mm. long, 3.5–6 mm. broad; petals 14–20 mm. long, 6–12 mm. broad (rarely 6 in number, and then the sixth one very narrow), 6–9-dentate; torus about 6 mm. in diameter; stamens 55–75, about 3-seriate, 10–12 mm. long, the filaments short, 2–2.5 mm. long, the anthers (excl. awns) 3–4 mm. long, the awns 4–7 mm. long; ovary 3–5-locular, each locule about 16-ovulate,

the style 9–13 mm. long; capsules usually solitary, oblong-ellipsoid, 3–5 cm. long (to 6 cm. ex White & Francis), 2.5–3.5 cm. broad, 3–5-valved, the pericarp woody, 4–8 mm. thick, closely brown-tomentellous without; seeds usually 6–10 per locule, ellipsoid, $8-12 \times 4-5$ mm., the aril covering the distal one-third and extending down one side nearly to the hilum, the testa dark castaneous.

Sloanea (§ *Pachycarpea*) *Forbesii* F. v. Muell. in Vict. Nat. 8: 164, nomen. 1892, in op. cit. 9: 111. 1892, in Jour. Bot. 31: 323. 1893; Bak. f. in Jour. Bot. 61: Suppl. 5. 1923.

Echinocarpus Forbesii Schlechter in Bot. Jahrb. 54: 148. 1916.

BRITISH NEW GUINEA: Central Division: Kanosia, alt. about 15 m., *Carr 11584* (NY) (tree about 21 m. high, on river-flats; flowers cream-colored); Mafulu, alt. 1250 m., *Brass 5399* (A, NY) (large tree, in lower primary forest; bark thick, lenticellate, pale brown; wood soft, pale; leaf-nerves pale, prominent on both sides; fruits pale brown; seeds brown-black, with red aril). NETHERLANDS NEW GUINEA: Bernhard Camp, Idenburg River, alt. 75 m., *Brass & Versteegh 14029* (tree 21 m. high, common in primary rain-forest of lower mountain slope; trunk 41 cm. diam.; crown not wide-spreading; bark 8 mm. thick, brown, fairly smooth; sap-wood white; heart-wood brown; flowers white); 4 km. southwest of Bernhard Camp, alt. 800 m., *Brass & Versteegh 13160* (tree 20 m. high, common in primary rain-forest on the flat plain; trunk 60 cm. diam.; crown not wide-spreading; bark 9 mm. thick, brown; wood yellow-brown; fruits brown).

Among the specimens available to me, those cited above agree best with the descriptions of *S. Forbesii*, based on *Forbes 273*, from Sogere. If my identification is correct, the leaf-pubescence is somewhat less obvious than implied by Schlechter, but it agrees fairly well with Mueller's description (1893) of "leaves . . . soon almost glabrous on the surface, puberulous beneath . . ." The following descriptive notes are based on the above-cited specimens:

Petiole usually 2–4 cm. long; leaf-blades 15–22(–30) cm. long, 9–15 cm. broad, often puberulent on nerves beneath and usually persistently barbellate in axils of nerves; inflorescences axillary, short-racemose, short-pedunculate, 2–5-flowered, the rachis 2–4 cm. long or sometimes shorter, the pedicels very slender in flower, 20–35 mm. long; flowers 4–6-merous; sepals 13–15 mm. long, 4–5 mm. broad; petals 22–25 mm. long, 13–16 mm. broad, 6–11-dentate; torus about 6 mm. in diameter; stamens about 100 [25–30 according to Mueller, surely an error, as the species of this relationship never have so few stamens], 4- or 5-seriate, 12–13 mm. long, the filaments 5–6 mm. long, the anthers (excl. awns) 3–3.5 mm. long, the awns 3.5–4 mm. long; ovary 3- or 4(appearently rarely 2-)-locular, each locule 20–22-ovulate, the style 20–25 mm. long; capsules oblong-ellipsoid, 5–8.5 cm. long, 3.5–6.5 cm. broad, 3- or 4(rarely 2-)-valved, the pericarp woody, 10–20 mm. thick, closely brown-velutinous without, eventually subglabrescent; seeds usually about 6–12 per locule, ellipsoid, $10-13 \times 4-5$ mm., the aril covering the distal quarter and extending down one side nearly to the hilum, the testa nigrescent.

From the above discussions of *S. papuana* and *S. Forbesii*, it is seen that the distinctions between them are less sharp than implied by Schlechter, that is, if my identifications are correct. However, it seems that the two species may be maintained, on the ground that *S. Forbesii* has larger leaf-blades on the average, with more persistent (but nevertheless inconspicu-

ous) hairs beneath, somewhat larger flowers, longer filaments, more numerous ovules, a longer style, and larger and much thicker-walled fruits.

Brass & Versteegh 13160, a fruiting specimen, agrees precisely with *Brass 5399*; *Brass & Versteegh 14029* bears immature flowers which are smaller than those of *Carr 11584* as to petals, stamens, and style, but which agree in all fundamental characters. Apparently the flowers expand rapidly after the bud opens, and measurements based on flowers which are not fully mature are unreliable.

Sloanea (§ *Pachycarpaea*) *aberrans* (Brandis) comb. nov.

Elaeocarpus aberrans Brandis in Kew Bull. 1899: 97. 1899.

BRITISH NEW GUINEA: Central Division, Dieni, Ononge Road, alt. 500 m., *Brass 3944* (A, NY) (tall tree with buttressed trunk and spreading crown, common in rain-forest; leaves paler beneath; flowers pale green).

The type of *Elaeocarpus aberrans* was collected on Mt. Scratchley, Central Division of British New Guinea, alt. 2000–4000 ft., by Giulianetti. The cited *Brass* collection agrees excellently with the original description, differing only in its more numerous stamens; this character may be variable or the original observation may have been inaccurate. The species is related to *S. papuana* (Schlechter) A. C. Sm., differing in having its leaf-blades more gradually narrowed to an attenuate base, its petals broader, and its ovules more numerous. Since the original description omits certain important points and dimensions, the following supplementary notes are offered:

Petiole 8–25 mm. long; leaf-blades (6–)9–15 cm. long, (3–)5–7 cm. broad, glabrous at anthesis; inflorescence axillary, short-racemose, (1–)2–6-flowered, the rachis up to 3 cm. long, the pedicels slender, 20–30 mm. long at anthesis; flowers usually 4-merous but sometimes 5-merous; sepals 10–12 mm. long, 5–6 mm. broad; petals 17–20 mm. long, 12–16 mm. broad, 7–14-dentate; torus 5–6 mm. broad; stamens 75–80 (50–60 ex Brandis), 10–11 mm. long, copiously hispidulous except for the glabrous awn, the filaments about 3 mm. long, the anthers (excl. awns) 3–4 mm. long, the awns 4–5 mm. long; ovary 3- or 4-locular, each locule 20–22-ovulate, the style 11–12 mm. long, sulcate.

Another specimen of this relationship, or possibly also representing the species, is *Clemens 376*, from Sattelberg, Morobe District, Northeastern New Guinea, alt. about 1050 m. (tree 30–38 m. high, in forest; trunk 60 cm. diam.; buds yellow-green). An exact comparison of this collection with *Brass 3944* is not satisfactory, as the *Clemens* plant bears only immature flowers. In foliage it seems similar to *S. aberrans*, although the leaves are somewhat smaller. Its immature petals are laterally connate into a corolla, but whether this feature persists at maturity (as in § *Antholoma*) remains to be seen; in this case the individuality of the petals is apparent. The locules are 24–26-ovulate.

Sloanea (§ *Pachycarpaea*) *gymnocarpa* sp. nov.

Arbor alta, ramulis apicem versus gracilibus (3–5 mm. diametro) rugulosis leviter angulatis pedicellisque minute brunneo-puberulis demum forsan glabratibus; foliis saepe oppositis interdum alternatis, petiolis robustis subteretibus 3–7 cm. longis apice valde incrassatis, laminis chartaceo-

coriaceis in sicco olivaceis late ellipticis, 13–22 cm. longis, 8–13 cm. latis, basi late obtusis vel rotundatis, apice obtuse et breviter cuspidatis raro subrotundatis, margine undulato-crenatis vel subintegris, utrinque glabris vel interdum subtus in axillis nervorum inconspicue barbellatis, costa utrinque prominente, nervis lateralibus utrinsecus 8–11 subpatentibus utrinque valde elevatis, rete venularum copioso utrinque leviter prominulo vel subplano; fructibus infra folia solitariis (vel interdum binis?), pedunculo sub fructu robusto (5–6 mm. diametro) glabro tereti 5–7 cm. longo, pedicellis sub fructu valde incrassatis (apice ad 10 mm. diametro) 2–2.5 cm. longis ut pedunculo glabro et ruguloso; capsulis ovato-ellipsoideis 4-angulatis maturitate 11–12 cm. longis et 6–7 cm. latis, 4-valvatis, valvis basi 3.5–6 cm. latis longitudinaliter conspicue sulcatis; pericarpio lignoso 13 (apice)–23 (basi) mm. crasso, extus indumento densissimo arcto brunneo-velutino induto demum subglabrescente et valde ruguloso, intus impressionibus seminum valde notato; seminibus in quoque loculo 10–16 ellipsoideis, 11–15 mm. longis, 4–5 mm. latis, basi acutis vel ad hilum cuspidatis, apice rotundatis, arillo conspicuo crasso quartam apicalem seminis obtegente atque uno latere fere ad hilum extenso, testa variegata.

BRITISH NEW GUINEA: Upper Fly River region, Palmer River, 2 miles below junction of Black River, alt. 100 m., *Brass 7259* (TYPE), July 1936 (tall spur-buttressed tree, common in river flood-bank forest; bark gray, lenticellate; fruit solitary on long peduncles below the leaves).

Although *S. gymnocarpa*, like *S. paradisearum* F. v. Muell., is known from the upper Fly River region, the two species are quite unlike in their fruit-indument and their arils, and they belong to different sections of the genus. *Sloanea gymnocarpa* further differs from Mueller's species in its longer-petioled leaves. Among the other species of § *Pachycarpaea*, *S. gymnocarpa* is most suggestive of *S. Forbesii* F. v. Muell. in its large leaves. It differs, however, in its longer petioles, its more completely glabrescent foliage, its obtuse or rounded but scarcely subcordate leaf-bases, and its even larger capsules. The aril- and seed-characters of the two species are essentially similar.

Sloanea (§ *Pachycarpaea*) *coriacea* Ridley in Trans. Linn. Soc. II. Bot. 9: 22. 1916.

Judging from the original description of *S. coriacea*, collected by the Wollaston Expedition along the Tsingarong River, alt. 3100 ft., south of Mt. Carstensz, Netherlands New Guinea, the species definitely belongs in § *Pachycarpaea*. It seems to be unrepresented in the material available to me, being suggestive, according to the description, of the species proposed below as *S. anacantha* and *S. insularis*.

Sloanea (§ *Pachycarpaea*) *anacantha* sp. nov.

Arbor grandis, ramulis gracilibus teretibus vel apicem versus angulatis glabris; foliis oppositis vel alternatis, petiolis leviter canaliculatis gracilibus glabris 1.5–2.5 cm. longis, laminis chartaceo-subcoriaceis in sicco fusciscentibus ovato-ellipticis, (6–)9–16 cm. longis, (3.5–)5–8 cm. latis, basi late obtusis vel subacutis, apice in acuminem breve obtusum interdum emarginatum angustatis, margine subintegris vel obscure undulatis, utrinque glabris raro subtus in axillis nervorum obscure barbellatis, costa supra elevata subtus prominente, nervis lateralibus utrinsecus 5–7 arcuatis supra

subplanis subtus elevatis, rete venularum intricato utrinque prominulo; inflorescentiis completis non visis sed ut videtur breviter racemosis paucifloris, pedicellis sub anthesi gracilibus glabris ad 33 mm. longis, sepalis petalisque 4 vel 5; sepalis carnosus deltoideo-lanceolatis, 14–17 mm. longis, 6–8 mm. latis, subacutis, extus glabris, intus et margine incrassato dense tomentellis; petalis submembranaceis oblongis, 26–28 mm. longis, 14–19 mm. latis, utrinque obscure puberulis glabrescentibus, apice 6–8-dentatis, lobis obtusis 2–3 mm. longis; toro carnoso complanato circiter 10 mm. lato; staminibus 90–100 circiter 5-seriatis 11–13 mm. longis ubique arista inclusa copiose hispidulis, filamentis carnosis teretibus 3–3.5 mm. longis, antheris arista subulata 4–5 mm. longa exclusa 3.5–4.5 mm. longis; ovario ovoideo angulato 4- vel 5-loculari et styli basi dense brunneo-tomentellis, ovarii pariete crasso intus puberulo, loculis circiter 28-ovulatis, stylo crasso subulato 10–12 mm. longo sulcato superne glabro; capsula unica visa oblongo-ellipsoidea 4-angulata, circiter 7.5 cm. longa et 4.5 cm. lata, 4-valvata, valvis basi 3–3.5 cm. latis longitudinaliter leviter sulcatis; pericarpio lignoso 13–16 mm. crasso, extus ruguloso et copiose arcute brunneo-velutino; seminibus paucis ut videtur 6–8 in quoque loculo ellipsoideis, 10–12 mm. longis, 5–6 mm. latis, basi subacutis, apice rotundatis, arillo crasso apicem seminis obtegente et uno latere fere ad hilum extenso, testa in sicco nigrescente nitida.

BRITISH NEW GUINEA: Central Division, Mafulu, alt. 1250 m., *Brass 5510* (A, TYPE, NY), Nov. 16, 1933 (large tree, with narrow flange-like buttress-roots, in tall forest of lower levels; bark pale brown; leaves smooth, dark; flowers yellow; fruit brown, with red seeds).

Sloanea anacantha, a species characterized by having its leaf-blades acute to obtuse at both ends, with the veinlet-reticulation intricate and prominulous, is probably most closely allied to *S. coriacea* Ridley. It differs from this in having its leaves averaging smaller and with fewer secondaries, in its larger flowers, and in its glabrous pedicels and outer surface of sepals. The last character distinguishes the new species from all the other known Papuan members of § *Pachycarpaea*, in which the pedicels and the outer surfaces of the sepals are persistently pubescent past anthesis.

Sloanea (§ *Pachycarpaea*) *insularis* sp. nov.

Arbor ad 30 m. alta, ramulis subteretibus rugulosis apicem versus 2–5 mm. diametro mox glabris; foliis oppositis vel alternatis, petiolis glabris gracilibus subteretibus 1–3 cm. longis apice incrassatis, laminis chartaceo-subcoriaceis fuscescentibus ovato-ellipticis, (8–)12–19 cm. longis, (4.5–)6–9 cm. latis, basi late obtusis vel anguste rotundatis, apice in acuminem ad 1 cm. longum obtusum angustatis, margine undulato-crenatis vel subintegris, utrinque glabris vel subtus costa nervisque evanescenter puberulis, costa supra paullo elevata subtus prominente, nervis lateralibus utrinsecus 6–10 erecto-patentibus supra leviter subtus valde elevatis, rete venularum intricato utrinque plano vel inconspicue prominulo; inflorescentiis axillari-bus breviter racemosis (1–)2–4-floris, pedunculo brevi, rhachi ad 1.5 cm. longa gracili pedicellisque cano-puberulis, pedicellis sub anthesi gracilibus 15–28 mm. longis sub fructu valde incrassatis; sepalis 5 vel 6 subcoriaceis ovato-oblongis, 12–13 mm. longis, 4–6 mm. latis, subacutis, utrinque puberulo-tomentellis, interdum plus minusve connatis; petalis 5 vel 6 (interdum ad 8 angustioribus paucidentatis) submembranaceis oblongis,

16–18 mm. longis, 10–11 mm. latis, utrinque pallido-puberulis subglabratiss, apice plerumque 7–10-dentatis, lobis deltoideo-oblongis obtusis circiter 2 mm. longis; toro complanato circiter 7 mm. lato minute velutino; staminibus 85–125 circiter 4- vel 5-seriatis 12–13 mm. longis ubique arista glabra excepta minute hispidulis, filamentis gracilibus subteretibus 5.5–6.5 mm. longis, antheris arista subulata 2–3 mm. longa exclusa 4–4.5 mm. longis; ovario ovoideo leviter angulato 3- vel 4-loculari et stylo basim versus brunneo-velutinis, ovarii pariete crasso intus subhirsuto, loculis 18–22-ovulatis, stylo crasso subulato circiter 18 mm. longo sulcato superne glabro; capsula unica visa ellipsoidea leviter angulata, ad 5.5 cm. longa et 3.5 cm. lata, 4- vel forsan 3-valvata, valvis basi circiter 2.5 cm. latis; pericarpio lignoso 8–12 mm. crasso, extus dense et arcte velutino; seminibus paucis ellipsoideis, circiter 12×5 mm., basi obtusis, apice rotundatis, arillo apicem seminis obtegente et uno latere fere ad hilum extenso, testa in sicco atro-castanea nitida.

SOLOMON ISLANDS: Bougainville: Koniguru, Buin, alt. 1200 m., *Kajewski* 2127 (TYPE), Aug. 20, 1930 (tree up to 30 m. high, common in rain-forest; sepals bright cream-green; fruit light green; native name: *twino*; timber said to be very durable; sap used by natives as source of a black dye); Siwai, *Waterhouse* 97 (NY) (tree about 25 m. high; native names: *kuinotui*, *tugtugini*); Guadalcanal: Uulolo, Tutuve Mt., alt. 1200 m., *Kajewski* 2594 (tree to 20 m. high, common in rain-forest; bark mottled).

In the shape of its leaves, *S. insularis* suggests *S. coriacea* Ridley and *S. anacantha* (above described). It differs from *S. anacantha* in its pubescent pedicels and sepals and its less obvious veinlet-reticulation, as well as in minor floral details, such as its presumably smaller petals, longer filaments, longer style, and fewer ovules. The original description of *S. coriacea* does not permit a very accurate comparison of *S. insularis* with it, but apparently the Solomon Islands species differs at least in its less obvious venation, slightly larger flowers, and longer filaments.

This species extends the known range of *Sloanea* into the Solomon Islands. Of the above-cited specimens, *Waterhouse* 97 has the only mature flowers, from which the stated dimensions are taken. The type has young flowers and a single mature fruit, while *Kajewski* 2594 has very young fruits.

§ ANTHOLOMA

Sloanea § *Antholoma* (Labill.) comb. nov.

Antholoma Labill. Rel. Voy. Rech. Pérouse 2: 235. *pl.* 41. 1800, Nov. Holl. Pl. Sp. 2: 121. 1806; Choisy in DC. Prodr. 1: 565. 1824; Endl. Gen. Pl. 1030. 1840; Planch. in Ann. Sci. Nat. IV. 2: 260. 1854; Baill. in Adansonia 2: 21. *pl.* 1. 1861; Benth. & Hook. f. Gen. Pl. 1: 239. 1862; Vieill. in Bull. Soc. Linn. Normand. 9: 334. 1865; K. Schum. in E. & P. Nat. Pfl. III. 6: 7. 1890; Schlechter in Bot. Jahrb. 54: 154. 1916; O. C. Schmidt in Nova Guin. Bot. 14: 155. 1924.

In describing the genus *Antholoma*, based on the New Caledonian *A. montana*, Labillardière did not refer it to a family. Choisy, in 1824, unaccountably referred the genus to the Marcgraviaceae, in which he was followed by Endlicher. Planchon, in 1854, was apparently the first properly to place *Antholoma* in the "Tiliacées-Elaeocarpées." In this he was followed by Baillon, in 1861, and Bentham (in Jour. Linn. Soc. 6: 123. 1862), who states that *Antholoma* "is indeed closely allied to *Sloanea*,

differing chiefly in the petals united into a tubular, almost conical corolla." Bentham thus repudiated his earlier suggestion (in op. cit. 5: Suppl. 2: 74. 1861) that the genus was nearer the Sapotaceae than the Tiliaceae.

Apparently no student of the group has thus far questioned the generic status of *Antholoma*, now known from three New Caledonian and two New Guinean species, although its close affinity to *Sloanea* has been generally recognized. The Archbold Expeditions have added nine collections to *Antholoma*, previously reported from New Guinea from only three collections. Therefore a more careful consideration of the genus is now possible, and it becomes evident that the only important generic character which separates it from *Sloanea*, the presence of a corolla of fused petals, is not constant. In various species the corolla is sometimes split to the base on one side, while in *Sloanea Archboldiana* (described below) the corolla, although superficially gamopetalous and characteristically plicate, often consists of two to four entirely distinct petals of various widths. In all other fundamental characters, *Antholoma* resembles *Sloanea* § *Pachycarpaea*, in which, as a matter of fact, the petals are occasionally loosely connate. A gradual transition between *Antholoma* and *Sloanea* is thus established, and it seems unwise to retain Labillardière's genus as distinct.

In characters pertaining to the seed, a slight difference between § *Antholoma* and § *Pachycarpaea* is discernible. In the latter section, the aril is thick and waxy, even when dried, and the lateral flange tapers very gradually toward the hilum. In § *Antholoma*, the aril becomes thin and papery when dried, and the lateral flange tapers more abruptly, being essentially triangular. Furthermore, the testa of § *Antholoma* appears to be thinner and more brittle than that of § *Pachycarpaea*.

The two groups proposed in *Antholoma* by Schmidt (loc. cit.), *Papuanæ* and *Montanæ*, are not very satisfactory as a basis for separating the New Guinean and the New Caledonian¹ species of this alliance. In its solitary flowers, for instance, *Sloanea haplopoda* agrees with the New Guinean rather than the New Caledonian species and thus provides a transition, since its entire long-petiolate leaves suggest the other New Caledonian species. Some of the New Guinean species also have scarcely dentate leaves, and the number of ovary-locules is not of primary importance. The section, as it includes both New Caledonian and New Guinean representatives, seems very coherent and perhaps not in need of further division.

Below I propose three new species of § *Antholoma*, which is therefore now represented by eight species, of which five are New Guinean.

¹In view of the proposed reduction of *Antholoma* to *Sloanea*, it seems advisable to record the three new combinations which are necessary for the New Caledonian species: *Sloanea* (§ *Antholoma*) *montana* (Labill.) comb. nov.

Antholoma montana Labill. Rel. Voy. Rech. Pérouse 2: 236. pl. 41. 1800, Nov. Holl. Pl. Sp. 2: 122. 1806; Vieill. in Bull. Soc. Linn. Normand. 9: 335. 1865.

Sloanea (§ *Antholoma*) *Billardieri* (Vieill.) comb. nov.

Antholoma Billardieri Vieill. in Bull. Soc. Linn. Normand. 9: 335. 1865.

Sloanea (§ *Antholoma*) *haplopoda* (Guillaumin) comb. nov.

Antholoma haplopoda Guillaumin in Bull. Mus. Hist. Nat. Paris 26: 259. 1920.

Sloanea (§ *Antholoma*) *Tieghemi* (F. v. Muell.) comb. nov.

Antholoma Tieghemi F. v. Muell. in Vict. Nat. 8: 164, nomen. 1892, in op. cit. 9: 111. 1892, in Jour. Bot. 31: 322. 1893; Schlechter in Bot. Jahrb. 54: 155. 1916; Lane-Poole, Rep. For. Res. Papua 110. 1925; White & Francis in Proc. Roy. Soc. Queensl. 38: 239. 1927.

BRITISH NEW GUINEA: Central Division, Mt. Tafa, alt. 2400 m., *Brass* 5064 (A, NY) (bush 1–2 m. high, with upright branching habit, common on old landslips; leaves rather stiff, shining above; corolla pale yellow-green).

Antholoma Tieghemi, based on a collection made near the summit of Mt. Yule (not far from Mt. Tafa, with an elevation exceeding 3000 m.), was originally described "from very fragmentary material." In view of this, too close an agreement between Mueller's descriptions and *Brass* 5064 is perhaps not to be expected. However, our specimen agrees with Mueller's plant in the essential details, apparently differing in its usually larger leaves (interspersed with leaves only 2–3 inches long, as described for *Antholoma Tieghemi*), slightly longer sepals and corolla, stamens nearly twice as long and more numerous ("60–70" ex Mueller), and larger fruits and seeds. In spite of these differences, it seems most likely that the *Brass* collection represents Mueller's species. It also seems probable that *Lane-Poole* 370, collected in the Owen Stanley Range at 6000 ft. and briefly discussed by Lane-Poole and White and Francis, represents the same species as *Brass* 5064. A description based entirely on *Brass* 5064 is given below.

Low shrub, the young branchlets and leaves copiously brown-floccose-tomentellous, soon glabrescent, the branchlets slender, angled and 2–3 mm. in diameter distally; leaves alternate, the petioles slender, subterete, 1–2.5 cm. long, the blades subcoriaceous or sometimes papyraceous, greenish or olivaceous when dried, elliptic, diverse in size, 6–15 cm. long, 3–10 cm. broad, broadly obtuse or rounded at base, abruptly cuspidate at apex with a callose-apiculate tip up to 1 cm. long, remotely but conspicuously spinulose-serrate at margins, the costa and the 4–7 lateral nerves raised above and prominent beneath, the veinlet-reticulation intricate and prominulous on both surfaces; inflorescences axillary, usually 1-flowered, the peduncle and pedicel subcontinuous, articulate, slender, 3–4 cm. long, at first tomentellous, glabrate in fruit; sepals 4 (2 sometimes fused), carnose-coriaceous, deltoid-oblong, 15–18 mm. long, 7–10 mm. broad, subacute, closely puberulent-tomentellous on both surfaces; petals completely fused into a submembranaceous campanulate corolla, this puberulent-tomentellous on both sides, soon glabrescent distally, copiously longitudinally nerved and plicate distally, 30–40 mm. long at anthesis, 7–12 mm. broad at base, flaring to 25–35 mm. at apex, copiously dentate, the teeth deltoid, 2–3 mm. long and broad, subacute; torus thick-carnose, flattened, about 10 mm. broad, rugose, copiously velutinous; stamens 90–100, about 4-seriate, erect, hispidulous throughout, 13–14 mm. long, the filaments slender, subterete, about 5 mm. long, the anther-locules 4.5–6 mm. long, the awns subulate, 3–3.5 mm. long; ovary triquetrous-ellipsoid, sharply angled, 3-locular (probably sometimes 2-locular), copiously velutinous, the locules about 18-ovulate, the style subulate, sulcate, about 25 mm. long, at length deeply 3-fid; capsules narrowly triquetrous-ellipsoid and 3-valved (or somewhat flattened and 2-valved), 3.5–5.5 cm. long, 2–2.5 cm. broad, the pericarp 4–6 mm. thick, rugulose and eventually glabrate without; seeds few, some-

times only 1 per locule, ellipsoid, 13–15 mm. long, 7–8 mm. broad, subacute at base, rounded at apex, the aril thin, papery when dried, covering the distal $\frac{1}{3}$ to $\frac{1}{2}$ and sinuate-margined, extending down one side in a narrowing strip nearly to the hilum, the testa castaneous, shining, very thin and brittle.

Sloanea (§ *Antholoma*) *Lamii* nom. nov.

Antholoma papuana O. C. Schmidt in Nova Guin. Bot. 14: 155. t. 17. 1924; non

Sloanea papuana A. C. Sm. [*Echinocarpus papuanus* Schlechter].

From the description and the excellent plate, this species seems to be unrepresented in the collections of the Archbold Expeditions. It is based on *Lam* 1930, "Bivak auf dem Rücken des Doorman-Massives in 2480 m. Höhe," Netherlands New Guinea. *Sloanea Lamii* most nearly suggests *Brass* 5064, which I have above referred to *S. Tieghemi*, and Schmidt's species would indeed appear to be close to Mueller's, at least as I have interpreted this. It can probably be distinguished, however, by its longer leaf-acumen, much longer sepals (28–30 mm. long), and shorter-awned anthers. In the description of *Antholoma papuana* the stamens are said to be glabrous, but on the plate they are shown as copiously setulose, and this is doubtless correct.

Sloanea (§ *Antholoma*) *Archboldiana* sp. nov.

Arbor ad 15 m. alta, partibus juvenilibus omnino copiose fulvo-floccoso-tomentellis mox subglabrescentibus, ramulis subteretibus vel superne angulatis et 2–3 mm. diametro; foliis oppositis vel alternatis, petiolis gracilibus supra leviter canaliculatis 5–25 mm. longis, laminis chartaceo-subcoriaceis in sicco fuscescentibus ellipticis vel obovato-ellipticis, 4–11 cm. longis, 2.5–6 cm. latis, basi subacutis vel late obtusis, apice obtusis vel in acuminem obtusum ad 5 mm. longum abrupte angustatis, margine undulatis vel remote callosocrenulatis, maturitate glabris vel subtus dispersim floccoso-puberulis et interdum in axillis nervorum persistenter barbellatis, costa supra leviter elevata subtus prominente, nervis lateralibus utrinsecus 4–7 erecto-patentibus anastomosantibus supra paullo subtus valde elevatis, rete venularum intricato utrinque prominulo vel subimmerso; inflorescentiis axillaribus 1(raro 2-)-floris, pedunculo brevi et pedicello gracili sub anthesi ad 4 cm. longo obscure articulatis primo tomentello-puberulis sub fructu glabratibus; bracteis pedicelli paucis mox caducis, eis apice sub calyce plus minusve persistentibus, majoribus 1 vel 2 lanceolatis vel spatulatis ad 11×2.5 mm. tomentellis, minoribus 1–4 inconspicuis; sepalis 4 vel 5 (2 interdum connatis) carnosio-subcoriaceis ovato-oblongis, 14–20 mm. longis, 6–12 mm. latis, subacutis, margine incrassatis, utrinque dense brunneo-tomentellis; petalis in corollam interdum connatis, interdum 2 aequalibus latissimis, interdum 3 vel 4 et latitudine valde inaequalibus; corolla submembranacea 28–35 mm. longa apice ad 45 mm. diametro, utrinque puberula apicem versus glabrata et plicata, apice copiose dentata, lobis deltoideo-oblongis obtusis 2–4 mm. longis; toro carnosio circiter 7 mm. diametro dense brunneo-velutino; staminibus 75–100 plerumque 4- vel 5-seriatis maturitate 10–12 mm. longis ubique praeter aristae apicem dense hispidulis, filamentis gracilibus subteretibus 3–4 mm. longis, antheris arista subulata 2.5–4 mm. longa excepta 4–5.5 mm. longis; ovario 3- vel 4- vel raro forsan 2-loculari angulato et styli basi dense brunneo-velutinis, ovarii pariete crasso, loculis

16-20-ovulatis, stylo subulato 16-20 mm. longo sulcato vel angulato sub-integro; pedunculo et pedicello sub fructu subcontinuis valde incrassatis, capsulis ellipsoideis maturitate (3.5-)5-7.5 cm. longis et 2.5-4 cm. latis, 3- vel 4- vel raro 2-valvatis (valvis 2 in fructibus sterilibus solis visis), pericarpio lignoso 8-13 mm. crasso ruguloso et dense velutino demum glabrescente; seminibus 6-12 in quoque loculo obovoideis, 8-11 mm. longis, 4-6 mm. latis, basi subacutis, apice rotundatis, arillo tenui in sicco papyraceo quartam apicalem seminis obtegente sinuato-marginato atque uno latere fere ad hilum extenso, testa atro-castanea nitida tenui.

NETHERLANDS NEW GUINEA: Balim River; alt. 1600 m., *Brass & Versteegh 11174* (tree 8 m. high, frequent in relic forest on rocky banks of river; trunk 25 cm. diam.; crown small; bark 8 mm. thick, black, fairly rough; flowers yellow-green), *Brass 11837* (TYPE), Dec. 1938 (tree 7-8 m. high, common in relic forest on rocky banks of river; flowers yellow); Bele River, 18 km. northeast of Lake Habbema, alt. 2200-2300 m., *Brass & Versteegh 11130* (tree 13 m. high, frequent in old secondary forest; trunk 40 cm. diam.; crown not wide-spreading; bark 4 mm. thick, brown, rough; wood white; flowers yellow-green; fruits brown-green), *Brass 11217* (tree up to 15 m. high, common in old secondary forest; fruits brown, the seeds black, with orange-red aril); Arfak Mts., Angi, in the spinneys by Lake Gita, alt. 1900 m., *Kanehira & Hatusima 13675* (tree 8 m. high).

The type collection bears mature flowers, from which the above dimensions are taken, and also fruits; the latter are probably not typical for the species, being comparatively narrow, often 2-valved, and completely sterile. More normal fruits are associated with nos. 11130 and 11217, while an old fruit accompanies *Kanehira & Hatusima 13675*. Younger flowers are borne by no. 11174 and a few old flowers by no. 11130.

The new species is readily distinguished from the two thus far described from New Guinea in § *Antholoma*, *S. Tieghemi* (F. v. Muell.) A. C. Sm. and *S. Lamii* A. C. Sm., by its consistently smaller leaves with undulate-crenate or subentire, rather than spinulose-serrate, margins, and with less conspicuously cuspidate apices. In floral characters, *S. Archboldiana* is hardly distinguishable from its allies, although the corolla is often split down one side or variously divided into 2-4 petals. This fact, while of no specific consequence (all extremes being found on one plant), bridges the most significant difference between *Antholoma* and *Sloanea* § *Pachycarpaea*.

Sloanea (§ *Antholoma*) **perbella** sp. nov.

Arbor ad 28 m. alta multiramosa, ramulis gracilibus, ultimis brevibus angulatis 1-2 mm. diametro ferrugineo-tomentellis, vetustioribus subteretibus cinereis glabris; foliis alternatis vel suboppositis, petiolis gracilibus supra complanatis 4-16 mm. longis, laminis coriaceis fusciscentibus angulato-ellipticis, 2.5-5.5 cm. longis, 1.5-3 cm. latis, basi acutis vel late obtusis, apice in acuminem obtusum 3-7 mm. longum cuspidatis, margine remote calloso-crenatis vel conspicue undulatis, maturitate supra glabris subtus indumento crispo-ferrugineo-tomentello dense et persistenter obtectis, costa supra acute elevata subtus prominente, nervis lateralibus utrinsecus 3-5 patentibus supra valde prominulis subtus elevatis, rete venularum intricato supra prominulo vel immerso subtus indumento occulto; inflorescentiis axillaribus unifloris, pedunculo brevi et pedicello subcontinuis sub anthesi dense tomentello-puberulis, pedicellis 8-12 mm. longis bracteis paucis linearibus mox caducis apicem versus ornatis; sepalis 5 vel 6 (2 interdum con-

natis) carnososubcoriaceis deltoideo-lanceolatis, 13–15 mm. longis, 4–7 mm. latis, subacutis, utrinque puberulo-tomentellis; petalis in corollam campanulatam interdum uno latere ad basim fissam connatis, corolla papyraceo-submembranacea utrinque dense puberula sub anthesi 18–22 mm. longa et apice 13–17 mm. diametro (matura?), apicem versus plicata, apice copiose dentata, lobis oblongo-lanceolatis subacutis 2–3 mm. longis; toro 6–7 mm. lato minute velutino; staminibus circiter 50 plerumque 3-seriatis 9–10 mm. longis (submaturis) ubique minute hispidulis, filamentis crassis teretibus 2–2.5 mm. longis, antheris arista subulata 3–3.5 mm. longa excepta 4–5 mm. longis; ovario ovoideo angulato 3-loculari (an semper?) et styli basi dense brunneo-velutinis, loculis 12–14-ovulatis, stylo crasso-subulato 8–9 mm. longo sulcato superne glabro; pedunculo et pedicello sub fructu incrassatis subcontinuis ad 3 cm. longis, capsulis ellipsoideis maturitate ad 5×2.5 cm., 3-valvatis, valvis circiter 2 cm. latis dorso leviter sulcatis, pericarpio lignoso 4–7 mm. crasso ruguloso dense velutino demum glabrato; seminibus ut videtur paucis, modo sectionis arillatis.

NETHERLANDS NEW GUINEA: 18 km. southwest of Bernhard Camp, Idenburg River, alt. 2150–2200 m., *Brass & Versteegh 11990* (tree 28 m. high, frequent in primary forest on a ridge; trunk 43 cm. diam.; crown not wide-spreading; bark 9 mm. thick, gray, fairly smooth; wood yellow-brown; flowers green-yellow; fruits red-brown), *Brass 12710* (TYPE), Feb. 1939 (tree up to 25 m. high, plentiful on upper slopes of the ridges in mossy-forest; trunk 50 cm. diam.; flowers greenish yellow).

Sloanea perbella is readily distinguished from its allies by its small few-nerved leaves, which are persistently ferruginous-tomentellous beneath and somewhat angular in outline. The flowers are comparatively small, but this is not a very reliable character in § *Antholoma*, where the corolla and stamens elongate rapidly in maturing flowers. The comparatively small number of stamens and ovules is perhaps a more dependable feature.

The type bears flowers and mature fruits, while no. 11990 has a few flower-buds and fruits. Only one seed has been seen, and this, although imperfectly developed, has the thin partial aril characteristic of the section.

Sloanea (§ *Antholoma*) *Versteeghii* sp. nov.

Arbor ad 26 m. alta, partibus juvenilibus omnino copiose fulvo-squarrosotomentellis mox glabrescentibus, ramulis apicem versus conspicue complanatis 3–5 mm. latis, vetustioribus subteretibus cinereis; foliis oppositis vel alternatis, petiolis validis subteretibus vel leviter canaliculatis 6–20 mm. longis ut ramulis tomentellis mox glabratis, laminis coriaceis vel subcoriaceis fuscescentibus ellipticis, (7–)12–21 cm. longis, (4–)5–10 cm. latis, basi late obtusis vel subrotundatis, apice obtusis, margine integris vel haud undulatis, maturitate utrinque glabris vel subtus costa nervisque farinosopuberulis, costa supra elevata subtus valde prominente, nervis lateralibus utrinsecus 6–10 subrectis adscendentibus supra leviter subtus valde elevatis, rete venularum copioso utrinque prominulo vel subplano; inflorescentiis axillaribus unifloris, pedunculo et pedicello subcontinuis circiter 1.5 mm. longis validis sub anthesi puberulis demum glabratis, bracteis pedicelli paucis dense puberulis mox caducis, eis medium versus spathulatis ad 10 mm. longis, eis apicis lanceolatis 4–5 mm. longis; sepalis 4 carnososubcoriaceis lanceolato-oblongis, 17–21 mm. longis, 5–6 mm. latis, subacutis, utrinque copiose puberulo-velutinis; petalis in corollam siccitate sub-

membranaceam campanulatam connatis, corolla 27–30 mm. longa, apice circiter 25 mm. diametro, utrinque pallido-puberula, superne plicata, apice copiose dentata, lobis subacutis deltoideo-oblongis circiter 3×2 mm.; toro carnosio circiter 7 mm. diametro dense velutino; staminibus ut videtur circiter 70 plerumque 3-seriatis 11–12 mm. longis ubique copiose hispidulis, filamentis crassis subteretibus 3–3.5 mm. longis, antheris arista subulata loculos subaequante excepta 3.5–5 mm. longis; ovario acute angulato 3-vel 4-loculari et styli basi arcte brunneo-velutinis, loculis circiter 20-ovulatis. stylo crasso-subulato sulcato circiter 15 mm. longo; pedicellis sub fructu incrassatis ad 2 cm. longis, capsulis ellipsoideis ad 5×3 cm. 3-vel 4-valvatis, pericarpio lignoso 5–9 mm. crasso ruguloso velutino; seminibus in quoque loculo circiter 8 ellipsoideis, 9–10 mm. longis, 5–6 mm. latis, basi subacutis, apice rotundatis, arillo modo sectionis tenui apicali atque uno latere fere ad hilum extenso, testa atro-castanea nitida.

NETHERLANDS NEW GUINEA: 6 km. southwest of Bernhard Camp, Idenburg River, alt. 1500 m., *Brass & Versteegh 12514* (TYPE), Feb. 12, 1939 (tree 26 m. high, occasional in forest of the slopes; trunk 45 cm. diam.; crown not wide-spreading; bark 5 mm. thick, gray; sap-wood light brown; heart-wood brown; flowers green-yellow; fruits brown-green).

Sloanea Versteeghii differs from its similarly large-leaved New Guinean congeners, *S. Tieghemi* (F. v. Muell.) A. C. Sm. and *S. Lamii* A. C. Sm., in its coriaceous and essentially entire-margined leaf-blades, which are obtuse or nearly so at the apex, rather than cuspidate-acuminate, and which have more numerous secondaries; the combined peduncle and pedicel of the new species is comparatively short.

It is probable that *Brass & Versteegh 13503* (2 km. southwest of Bernhard Camp, alt. 800 m.) also represents *S. Versteeghii*, although it differs from the type in its spreading rather than suberect secondaries. This specimen is accompanied by mature fruits, which are up to 8×5 cm., with a pericarp 7–15 mm. thick and seeds similar to those described above. A more complete series of specimens is desirable to indicate the variation within the species.

SUMMARY

In the preceding pages 60 Papuan species of Elaeocarpaceae have been described as new, for the most part based upon the collections of the Archbold Expeditions. The new species are distributed in five genera as follows: *Sericolea* 5, *Aceratium* 9, *Elaeocarpus* 32, *Dubouzetia* 2, and *Sloanea* 12. Previously the family had been represented in our region by about 127 described species, of which all but a very few appear maintainable. Thus about 187 species of Elaeocarpaceae are now known from Papuasias, more than double the number known to Schlechter in 1916. A key to the genera occurring in Papuasias follows:

Stamens inserted within the disk or at its upper margin, the disk-surface free of stamens; anthers transversely dehiscent at apex, the clefts sometimes extending downward laterally; fruit various, but not a completely loculidically dehiscent capsule, the seeds not arillate.

Fruit a berry, the pericarp thin when dried, with inconspicuous mesocarp and endocarp; slender plants, often epiphytic; leaves opposite or subopposite; petals with the apex rounded, truncate, undulate, or 2- or 3-lobed; disk lobed, with the lobes often spreading, or rarely subcontinuous; stamens 10–15, not awned... *Sericolea*.

Fruit a drupe, the pericarp thick, with pulpy or fibrous mesocarp and bony endocarp; plants comparatively robust, not or rarely epiphytic; petals various, often copiously fimbriate, sometimes entire; disk annular-pulvinate or with fleshy lobes.

Leaves opposite or subopposite; petals dentate at apex, the margins toward base often laterally coherent by means of a tangled tomentum; stamens usually 15, rarely 12 or up to 20, not awned; fruits usually conical-ellipsoid, the pericarp often irregularly fissured, disclosing the thick fibrous mesocarp, which is firmly adherent to the endocarp.....*Aceratium*.

Leaves alternate, very rarely opposite (in Papuasias only in *E. sericoloides*); stamens indefinite, usually numerous, the clefts often extending downward laterally, one lip often awned; fruit usually ellipsoid to subglobose, the mesocarp pulpy or sometimes fibrous, at length usually free from the endocarp, which is sometimes conspicuously ornamented.....*Elaeocarpus*.

Fruit a capsule, at first imperfectly loculicidally dehiscent, finally completely septically dehiscent and separating into open cocci, the seeds conspicuously strophiolate; leaves alternate; petals involute and often subcoherent toward base, inconspicuously denticulate at apex; disk with carnose lobes; stamens 20-40, not awned, the anthers dehiscent by a small apical 2-lipped pore.....*Dubouzetia*.

Stamens inserted on the broad flattened disk-like surface of the torus; anthers dehiscent laterally, the clefts elongate but not extending across the apex, which is continued into a single short mucro or subulate awn; fruit a loculicidally dehiscent capsule, the seeds arillate.....*Sloanea*.

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NEW OR NOTEWORTHY PLANTS FROM SOUTHWESTERN CHINA¹

HUI-LIN LI

THIS paper consists of descriptions and notes based on selected specimens of plants mainly from Yunnan, with a few from the neighboring provinces Szechuan and Kweichow. The Yunnan material was accumulated through the extensive explorations of that province made in recent years under the auspices of the Fan Memorial Institute of Biology, with the financial co-operation of the Arnold Arboretum. Vast collections of plant specimens were assembled from practically all parts of the province. Some specimens from older collections made by A. Henry and J. F. Rock that have remained unnamed have also been considered. The Kweichow collections were made for the Botanical Institute of Sun Yatsen University.

A total of twenty-six presumably new species and a few new varieties and forms are described. Notes concerning previously described species new to these provinces are given, as well as a number of new synonyms. All types of the new forms herein described are deposited in the herbarium of the Arnold Arboretum.

ANNONACEAE

Mitrephora Hooker f. & Thomson

Mitrephora Maingayi Hook. f. & Thomson in Hook. f. *Fl. Brit. Ind.* 1: 77. 1872; King, *Ann. Bot. Gard. Calcutta* 4: 112. *t.* 154. 1893; Ast, *Suppl. Fl. Gén. Indo-Chine* 1: 100. 1938.

KWEICHOW: Chen-feng, Do-wan, *S. W. Teng* 90866, Sept. 13, 1936, a tree 10 ft. high, in dense woods, flowers white to yellow. Borneo, Malay Peninsula, Indo-China, Hainan; new to continental China.

HAMAMELIDACEAE

Corylopsis Siebold & Zuccarini

Corylopsis Veitchiana Bean, *Bot. Mag.* 136: *t.* 8349. 1910; Rehd. & Wils. in Sargent, *Pl. Wils.* 1: 425. 1913.

KWANGSI: No data, *Z. S. Chung* 82307; Tzu-yuen District, *Z. S. Chung* 83556, Aug. 5, 1937, a tree, in woods. KWEICHOW: Fan Ching Shan, Tou Shan, *Steward, Chiao & Cheo* 571, Sept. 5, 1931, a shrub 5 m. high, on rocky slopes in forests, alt. 1400 m.

This species was formerly known from western Hupeh; the present collection considerably extends its known range. The leaves of the Kwangsi plants are mostly larger than the others.

Corylopsis polyneura sp. nov.

Frutex 0.5 m. altus, ramis gracilibus, ramulis glabris cinereo-brunneis

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minute lenticellatis, lenticellis rotundatis albidis; foliis subchartaceis petiolatis oblongo-ovatis, 6–8.5 cm. longis, 3–5.5 cm. latis, leviter inaequilateralibus, margine uno interdum rectis, apice breviter acutis, basi subcordatis, margine sinuato-denticulatis, dentibus fere ad mucronem reductis, nervis lateralibus utrinsecus 8–14 dense compactis, inferioribus manifeste ramosis, cum costa supra distincte impressis subtus elevatis perspicuis, venulis dense reticulatis gracilibus supra subimpressis subtus elevatis; petiolis 0.5–1.5 cm. longis, glabris interdum parce stipitato-glandulosis; inflorescentiis ignotis; infructescentiis spicatis, 4.5 cm. longis, pedunculis 1.5 cm. longis, glabris; fructibus 4–6 mm. diametro, glabris atrobrunneis.

YUNNAN: Cham-pu-tong, Soo-roo-la, C. W. Wang 66738 (TYPE), Oct., 1935, a shrub 1.5 ft. high, in woods, alt. 3000 m., fruit greenish yellow.

A species apparently close to *Corylopsis platypetala* Rehd. & Wils. and *C. glaucescens* Hand.-Maz., differing in the more numerous veins, which are densely and compactly arranged, strongly impressed above, and distinctly elevated beneath, the lower one branching considerably, and also in the smaller fruits.

Mytilaria Lecomte

Mytilaria laosensis Lecomte, Bull. Mus. Hist. Nat. Paris 30: 504. 1924; Chun, Sun-yatsenia 1: 244. 1934.

YUNNAN: No data, J. C. Liu & C. Wang 85072, in 1939.

This Indo-Chinese species has been recorded by Chun (l. c.) from Kwangtung and Kwangsi; new to Yunnan. In addition to the plants enumerated by Chun, the following specimens are also noted from Kwangsi: W. T. Tsang 22180 and S. P. Ko 55988.

ROSACEAE

Neillia D. Don

Neillia serratisepala sp. nov.

Frutex circiter 1.3 m. altus, ramulis gracilibus teretibus glabris; foliis petiolatis subchartaceis oblongo-ovatis, 6–7.5 cm. longis, 2.5–4.5 cm. latis, caudato-acuminatis (acumine ad 1.5 cm. longo), basi truncatis vel subcordatis, margine dupliciter serratis, saepissime leviter 2–4-lobatis (lobis acutis, vix 1.2 cm. longis), in sicco olivaceis, subtus pallidioribus, supra leviter hirsutis vel glabrescentibus, subtus leviter pubescentibus, nervis lateralibus utrinsecus 5 vel 6, arcuato-ascendentibus, supra subconspicuis, subtus distinctis; petiolo circiter 5 mm. longo, pubescente; stipulis ovatis, circiter 6 mm. longis et 5 mm. latis, acutis, margine distincte serratis, glabris vel subglabris; inflorescentiis terminalibus vel axillaribus gracilibus glabris, axillaribus racemosis circiter 4 cm. longis, terminalibus paniculatis circiter 6 cm. longis; bracteis bracteolisque variis, ovatis vel ovato-lanceolatis, 4–8 mm. longis, 2–3 mm. latis, acutis vel acuminatis, serrulatis; pedicellis gracilibus, 2–3 mm. longis; calycis tubo 3 mm. longo, 2 mm. lato, pubescente, lobis 5, triangularibus, acuminatis, 1.5 mm. longis; petalis albis ovatis 1.5 mm. longis; staminibus numerosis, filamentis ad 1 mm. longis.

YUNNAN: Shang-pa, H. T. Tsai 59158 (TYPE), Oct. 31, 1934, a shrub 4 ft. high, in woods, alt. 2000 m., flowers white.

A species characterized by the pubescent leaves and calyces, the serrate sepals, and the very delicate inflorescences.

Rubus Linnaeus

Rubus pectinellus Maxim. Bull. Acad. Sci. St. Pétersb. 17: 147. 1871, Mém. Biol. 8: 374. 1871; Focke, Bibl. Bot. 17 [Heft 72]: 22, f. 6. 1910.

KWEICHOW: Hsu-feng, She-won-shan, *S. W. Teng* 90491, July 2, 1936, herb, in dense shade. Japan, Formosa, Fukien; new to western China.

Rubus aralioides Hance, Jour. Bot. 22: 41. 1884; Focke, Bibl. Bot. 17 [Heft 72]: 196. 1911.

KWEICHOW: Hsu-feng, *S. W. Teng* 90429, June 29, 1936, a shrub on open slopes, flowers purplish red. KWANGSI: Nam Tan-yuen, *C. Wang* 40855, June 22, 1937, a scandent shrub in waste places, alt. 2500 ft., fruit green. Kwangtung, Fukien; new to western China.

MELIACEAE

Dysoxylum Blume

Dysoxylum cupuliforme sp. nov. § *Eudysoxylum*.

Arbor circiter 8 m. alta, foliis alternis, circiter 35 cm. longis, petiolis rhachibusque glabris; foliolis circiter 11 subalternis chartaceis breviter petiolulatis utrinque glabris oblongis vel oblongo-lanceolatis, 10–15 cm. longis, 4–5 cm. latis, acutis, basi leviter inaequilateraliter rotundatis, nervis lateralibus utrinsecus 9–12, curvatis, supra inconspicuis, subtus perspicue elevatis, venis tertiariis utrinque obscuris; petiolulis 5 mm. longis, glabris; paniculis supra-axillaribus laxis paucifloris breviter ramosis, ramis inferioribus circiter 2 cm. longis; floribus paucis 4-meris, circiter 1.2 cm. longis, in ramis primariis plus minusve compacte dispositis, pedicellis dense puberulis dein glabratissimis, 3–5 mm. longis; calyce cupulato, crasse coriaceo dense puberulo dein glabrato, margine integro; petalis 4, liberis valde incrassatis, extus dense puberulis, oblongis, circiter 8 mm. longis et 4 mm. latis; tubo stamineo brevi, 1.5 mm. longo, 2 mm. diametro, paucae ciliato crenulato; antheris 8; disco 1 mm. longo, crenato; ovario villosio; stylo 3 mm. longo, leviter ciliato.

YUNNAN: Fo-hai, *C. W. Wang* 74908 (TYPE), July, 1936, alt. 1340 m., in forests, river side, flowers light yellow.

This species is near *Dysoxylum binectariferum* Hook. f. in most of its characters, both species being characterized by their coriaceous cupulate calyces. The new species can be distinguished from *D. binectariferum* by its much shorter, broader, and thicker calyx, which is entire and densely puberulous at first on the outside.

Dysoxylum filicifolium sp. nov. § *Eudysoxylum*.

Arbor circiter 20–30 m. alta, ramulis novellis dense pubescentibus, foliis alternis, circiter 55 cm. longis, petiolis rhachibusque dense pubescentibus; foliolis 15 vel 17 oppositis vel suboppositis breviter petiolulatis, membranaceis supra subglabris costa dense pubescente excepta, subtus molliter villosis, oblongo-lanceolatis, 8–14 cm. longis, 3–4.5 cm. latis, cuspidato-acuminatis, basi inaequilateraliter subrotundatis, nervis lateralibus utrinsecus 10–15, supra subconspicuis, subtus manifestis, venis tertiariis utrinque obscuris; petiolulis 3–5 mm. longis, dense pubescentibus; paniculis supra-axillaribus anguste pyramidatis laxis paucifloris, circiter 17 cm. longis; floribus paucis 4-meris circiter 4–5 mm. longis, in ramis primariis racemose dispositis, pedicellis circiter 1.5 mm. longis, puberulis; calyce puberulo, 1 mm. longo,

4-dentato, lobis orbicularibus, rotundatis, ad $\frac{1}{3}$ – $\frac{1}{2}$ connatis; petalis 4 glabris spathulatis obtusis, circiter 4 mm. longis et 1.5 mm. latis; tubo stamineo cylindrico, utrinque ciliato, crenulato, circiter 1.5 mm. diametro et 2.5 mm. longo; antheris 8; disco 1 mm. longo, villosa; stylo 2.5 mm. longo, leviter ciliato; stigmatibus capitatis; fructu immaturo subpyriformi, glabro, 1.1 cm. longo.

YUNNAN: Nan-chiao, C. W. Wang 75309 (TYPE), June, 1936, alt. 1760 m., mountain slopes, in forests, 90 ft. high, flowers green; Che-li District, Maan-shang, C. W. Wang 78581, Sept., 1936, alt. 1300 m., mixed forests, 80 ft. high, fruit greenish yellow.

This species resembles *Dysoxylum hainanense* Merr. in leaf characters, except that the leaflets of the new species are larger and fewer. The inflorescences as well as the individual flowers of *D. hainanense* Merr. are much the longer. Moreover, its calyx-lobes are free or almost free, while in our species they are united for $\frac{1}{3}$ to $\frac{1}{2}$ their length. Hence *D. hainanense* falls in § *Didymocheton*, while the new species is included in § *Eudysoxylum*.

Dysoxylum grandifolium sp. nov. § *Eudysoxylum*.

Arbor parva circiter 3 m. alta; foliis alternis magnis, circiter 80 cm. longis, petiolis rhachibusque glabris; foliolis circiter 11 alternis chartaceis breviter petiolulatis, utrinque glabris, elliptico-oblongis, 15–30 cm. longis, 8–14 cm. latis, acutis, basi inaequilateraliter rotundatis, nervis lateralibus utrinsecus 12–15, supra inconspicuis, subtus prominentibus, venis tertiariis utrinque obscuris; petiolulis 1 cm. longis; inflorescentiis floribusque ignotis; fructu subpyriformi elongato glabro, circiter 4.5 cm. longo et 1.8 cm. crasso, loculicide 2-valvo, pericarpio valde crasso, loculis 1-spermis.

YUNNAN: Nan-chiao, C. W. Wang 75342 (TYPE), June, 1936, alt. 1250 m., in ravine, in forests, 10 ft. high, fruit yellow.

This species is imperfectly represented by one leaf and one fruit. However, the striking characters revealed by these parts alone are sufficient to distinguish it from other known species. With flowering material available, it may possibly prove to be related to *Dysoxylum binectariferum* Hook. f. The 2-valved fruit may be due to a reduction in parts.

Dysoxylum hongkongense (Tutcher) Merr. Lingnan Sci. Jour. 13: 33. 1934; Merr. & Chun, Sunyatsenia 5: 90. 1940.

Chisocheton hongkongensis Tutcher, Jour. Linn. Soc. Bot. 37: 64. 1905.

YUNNAN: Fo-hai, C. W. Wang 73908, May, 1936; Nan-chiao, C. W. Wang 76972, June, 1936; Che-li District, Meng-la, C. W. Wang 78090, Sept., 1936; Che-li District, Meng-seeng, Dah-meng-lung, C. W. Wang 78449, 78449A, Sept., 1936; Che-li District, Dah-meng-lung, Maan-hung-han, C. W. Wang 78600, Sept., 1936; Jenn-yeh District, Meng-la, C. W. Wang 80596, 80662, Nov., 1936.

Originally described from Hong Kong, known also from Hainan; a new record for Yunnan. The occurrence of this Hainan and Hong Kong species, as well as of the following, *Dysoxylum Lukii* Merr., also from Hainan, in the southern part of Yunnan is worthy of note. It is highly probable that these species may eventually be found in Tonkin.

Dysoxylum Lukii Merr. Philip. Jour. Sci. 23: 247. 1923.

YUNNAN: Che-li District, C. W. Wang 78588, 78658, Sept., 1936.

Previously known only from Hainan; a new record for Yunnan. The Yunnan plants, compared with the Hainan type, are taller and with smaller

inflorescences and more numerous (about 15) leaflets; but these characters are also present in some of the Hainan specimens representing the species, such as *H. Y. Liang* 62273 and *F. C. How* 72718, which the Yunnan specimens closely match.

Dysoxylum spicatum sp. nov. § *Eudysoxylum*.

Arbor circiter 7 m. alta, ramulis glabris; foliis alternis, 50–70 cm. longis, petiolis rhachibusque glabris, foliolis 7–9 subalternis chartaceis breviter petiolulatis, utrinque glabris, ellipticis vel oblongo-ellipticis, 10–22 cm. longis, 5–10 cm. latis, cuspidatis, basi inaequilateralibus uno latere rotundatis altero subrectis, nervis lateralibus utrinsecus circiter 15, curvatis, supra inconspicuis, subtus manifestis, venis tertiariis utrinque inconspicuis; petiolulis 5 mm. longis, glabris; paniculis supra-axillaribus spicatis breviter pedunculatis, 11–14 cm. longis, glabris, pedunculis 1 cm. longis vel brevioribus; floribus 4-meris, 6–7 mm. longis, ad 3–6-fasciculatis, pedicellis glabris, 2–3 mm. longis; calyce 2 mm. longo, glabro, profunde 4-dentato, lobis acutis; petalis 4, extus glabris, oblongis, 5–6 mm. longis, 2 mm. latis; tubo stamineo cylindrico, 3 mm. longo, denticulato, extus puberulo, intus glabro; antheris 8; disco brevi leviter crenulato glabro; ovario hirsuto; stylo puberulo, stigmate distincte capitato.

YUNNAN: Szemao, south mountains, *A. Henry* 11748 (TYPE), in forests, alt. 5000 ft., a tree 20 ft. high, flowers white; Szemao, *A. Henry* 11748A, in forests, alt. 4000 ft., a tree 20 ft. high, flowers white.

This is apparently close to *Dysoxylum flavescens* Hiern, a species of the Malay Peninsula, particularly in being glabrous, and in having oblong-elliptic and cuspidate leaves and spicate inflorescences. The Chinese plant has larger leaves and glabrous petals, while the flowers are clustered on the main axis of the inflorescence, characters which may be used to differentiate it from Hiern's species.

Aglaia Loureiro

Aglaia attenuata sp. nov. § *Euaglaia*.

Arbor 5–13 m. alta, ramulis novellis ochraceo-lepidotis; foliis circiter 40 cm. longis, petiolis circiter 7 cm. longis rhachibusque teretibus glabris; foliolis 9 alternis breviter petiolulatis firme membranaceis, utrinque glabris, lanceolatis, 18–20 cm. longis, 3.5–5 cm. latis, inferioribus minoribus, acuminatis, basi inaequilateraliter attenuatis, nervis lateralibus utrinsecus 12–15 arcuato-adscentibus, supra subconspicuis, subtus prominulis, nervis tertiariis obscuris; petiolulis circiter 7 mm. longis, glabris; paniculis supra-axillaribus, laxis, parce lepidotis, 11–13 cm. longis, parce ramosis, paucifloris, pedunculis ad 4 cm. longis, ramis simplicibus vel breviter ramulosis; floribus 3 mm. longis, pedicellatis, pedicellis 4 mm. longis, rectis lepidotis; calyce subcupulato, 1.5 mm. longo, extus lepidoto, obtuse 5-dentato; petalis 3, obovatis, 3 mm. longis, extus parce pubescentibus vel glabris, concavis, imbricatis, basi cum tubo plus minusve connatis; tubo stamineo urceolato, deorsum angustato, circiter 2 mm. longo, glabro, antheris 6, circiter 1 mm. longis, inclusis; ovario pubescente, stigmate ovoideo glabro; fructu globoso, glabro, 1.8 cm. crasso, 1-loculari, calyce persistente, 5-dentato.

YUNNAN: Szemao, south mountains, *A. Henry* 12170 (fruit), alt. 4000 ft., a tree

15 ft. high; Szemao, *A. Henry 12228* (TYPE), in forests, alt. 4500 ft., a tree 30 ft. high, 12228A, in forests, alt. 5000 ft., a tree 40 ft. high.

A species characterized by its lanceolate, acuminate, and attenuate leaflets. It is apparently closely allied to *Aglaia tenuifolia* Li, described below, differing in the firmer, narrower, and more numerous leaflets, and in the shorter and more obtuse calyx-lobes.

Aglaia Wangii sp. nov. § *Hearnia*?

Arbor 3–13 cm. alta, ramulis lepidotis, indumento pallido; foliis circiter 50 cm. longis, modice petiolatis; petiolis 8–12 cm. longis rhachibusque teretibus, glabratibus; foliolis 7 vel 8 oppositis vel suboppositis aequalibus chartaceis breviter petiolulatis, supra lepidotis vel costa tantum lepidotis, subtus dense lepidotis, oblongo-lanceolatis, 14–18 cm. longis, 5–8 cm. latis, acuminatis, basi leviter inaequilateraliter cuneatis, nervis lateralibus utrinsecus 12–15, supra subconspicuis, subtus perspicue elevatis, venis tertiariis obscuris; petiolulis 5–8 mm. longis, lepidotis; paniculis fructigeris simplicibus, circiter 6 cm. longis vel longioribus, lepidotis; fructu subgloboso, circiter 2.3 cm. longo, 1.8 cm. lato, apice acuto, rufescente, glabro, 3-loculari, pedicello 1.3 cm. longo, calyce persistente, 4- vel 5-sepalo.

YUNNAN: Fo-hai, *C. W. Wang 73924*, May, 1936, alt. 1550 m., in thickets, 40 ft. high; Che-li District, Sheau-meng-yeang, *C. W. Wang 75593* (TYPE), Aug., 1936, alt. 960 m., in forest, 15 ft. high, fruit pink; Jenn-yeh District, Meng-la, *C. W. Wang 80772*, Nov., 1936, alt. 900 m., in mixed woods, 35 ft. high, fruit green.

A species characterized by the dense lepidote indumentum on the adult leaflets, especially on the under surface. It is apparently very close to the Malayan and Burman *Aglaia minutiflora* Bedd., which Beddome originally described as stellate-pubescent (*Ic. Pl. Ind. Or.* 1: 44. *t.* 193. 1874). In C. de Candolle's monograph (*Monogr. Phan.* 1: 616. 1878), it is described as lepidote, which agrees with the Chinese specimens. The Chinese plants in general differ from Beddome's species in having larger leaflets with acuminate apices, inequilateral bases, and pale indumentum. The fruit is 3-celled. Flowering material is desirable for further characterization.

Aglaia Wangii var. *macrophylla* var. nov.

A typo speciei differt foliolis alternis, ad 30 cm. longis et 11.5 cm. latis, fructu globoso, circiter 2.2 cm. crasso, calyce persistente, 5-sepalo.

YUNNAN: Nan-chiao, *C. W. Wang 75131* (TYPE), June, 1936, alt. 1400 m., in forest, 60 ft. high, fruit reddish white.

Aglaia perviridis Hiern in Hook. f. *Fl. Brit. Ind.* 1: 556. 1875; C. DC. *Monogr. Phan.* 1: 610. 1878.

YUNNAN: Che-li District, Jah-kuang, *C. W. Wang 79063*, 79064, Sept., 1936; Jenn-yeh District, Lung-huk, *C. W. Wang 80112A*, Oct., 1936.

Previously known from the Khasia Mountains, India. *Wang 80112A* is a flowering specimen with 11-foliolate leaves. *Wang 79063* and 79064 are fruiting specimens with 9-foliolate leaves. The mature fruit is inequilaterally ellipsoid, 3.5 cm. long and 2 cm. wide, brownish when dry, and exactly matches Indian material available for comparison.

Aglaia tenuifolia sp. nov. § *Euaglaia*.

Frutex 2–5 m. altus, indumento in ramulis novellis lepidoto pallido; foliis

ad 40 cm. longis, petiolis 7–9 cm. longis rhachibusque teretibus, parce lepidotis vel glabratibus; foliolis 7 alternis tenuiter membranaceis breviter petiolulatis, utrinque glabris, in sicco utrinque virescentibus, oblongo-lanceolatis, superioribus 15–18 cm. longis, 4.5–5 cm. latis, inferioribus minoribus, 7–8 cm. longis, 3–3.5 cm. latis, acute cuspidatis, basi aequilaterialiter vel leviter inaequilateraliter cuneatis, nervis lateralibus utrinsecus 10–12, supra subconspicuis, subtus perspicuis, elevatis, adscendentibus, venis tertiariis obscuris; petiolulis circiter 5 mm. longis; paniculis supra-axillaribus, laxis, parce lepidotis, 8–14 cm. longis, parce ramosis, paucifloris, pedunculis ad 3 cm. longis, ramis simplicibus; floribus 3 mm. longis, longe pedicellatis, pedicellis 0.7–1 cm. longis, gracilibus, lepidotis, plerumque recurvis; calyce subcupulato, 1 mm. longo, obscure 5-dentato, lepidoto; petalis 3 obovatis obtusis, 2.5 mm. longis, extus parce pubescentibus vel glabris, concavis, imbricatis, basi cum tubo plus minusve connatis; tubo stamineo urceolato, deorsum angustato, circiter 2 mm. longo, antheris 6, 1 mm. longis, inclusis; ovario pubescente, stigmate angulato-cylindrico, apice rotundato.

YUNNAN: Che-li District, Dah-meng-lung, *C. W. Wang* 77803 (TYPE), Aug., 1936, alt. 1100 m., ravine, in dense forests, 4 m. high, frequent; Che-li District, Kuen-ger, *C. W. Wang* 79306, Oct., 1936, alt. 1100 m., in mixed forests, 2 m. high; Che-li District, *C. W. Wang* 78043A, Aug., 1936, alt. 800 m., in thickets, 5 m. high.

This species is characterized by the very thinly membranaceous, oblong-lanceolate, acutely cuspidate leaflets, the short lax inflorescences, and the slender, long, frequently recurved pedicels.

Aglaia yunnanensis sp. nov. § *Euaglaia*.

Frutex 7–10 m. altus, ramulis novellis lepidotis, indumento pallido; foliis circiter 35 cm. longis, petiolis 8–9 cm. longis rhachibusque teretibus, parce lepidotis vel glabratibus; foliolis 4 vel 5, breviter petiolulatis, firme membranaceis, utrinque glabris, oblongo-ovatis vel oblongo-lanceolatis, superioribus majoribus, circiter 20 cm. longis et 7.5 cm. latis, inferioribus minoribus, circiter 12 cm. longis et 4.5 cm. latis, ceteris magnitudine intermediis, apice breviter acute cuspidatis, basi inaequilateralibus uno latere subrotundatis altero subrectis, nervis lateralibus utrinsecus 10–12, patulo-adscendentibus, supra conspicuis, subtus perspicuis, elevatis, venis tertiariis subconspicuis vel obscuris; petiolulis 0.5–1 cm. longis, glabratibus; paniculis supra-axiillaribus laxis lepidotis, ad 14 cm. longis, parce ramosis paucifloris, pedunculis ad 5 cm. longis, ramis simplicibus vel ramulosis; floribus 4 mm. longis, pedicellis 5 mm. longis vel brevioribus, lepidotis, crassis pro more rectis; calyce cupulato, 2 mm. longo, extus lepidoto, profunde 5-dentato, lobis acutis; petalis 3 obovatis, 3 mm. longis, extus parce pubescentibus vel glabris, concavis, imbricatis, basi cum tubo plus minusve connatis; tubo stamineo urceolato, deorsum plus minusve angustato, circiter 2 mm. longo, glabro, antheris 6, circiter 1 mm. longis, inclusis; ovario plus minusve pubescente, stigmate obtuse conico, glabro.

YUNNAN: Fo-hai, *C. W. Wang* 74823A, June, 1936, alt. 1000 m., in ravines, 20 ft. high; same locality and habitat, *C. W. Wang* 74830 (TYPE), June, 1936, 30 ft. high.

A species resembling *Aglaia tenuifolia* Li in the short, lax, few-branched inflorescences, but readily distinguished by the shorter, thick, and more or less straight pedicels and the larger, fewer, and firmer leaflets.

ANACARDIACEAE

Dracontomelon Blume*Dracontomelon macrocarpum* sp. nov.

Arbor circiter 23 m. alta; foliis imparipinnatis 15-foliolatis, 50 cm. longis, rhachibus teretibus glabris; petiolis teretibus glabris, circiter 12 cm. longis; foliolis brevi-petiolutatis chartaceis utrinque glabris oblongis, 10–13 cm. longis, 3.5–4.2 cm. latis, acuminatis, basi profunde inaequilateralibus uno latere acutis altero rotundatis, margine integris, nervis lateralibus utrinsecus 8–10 utrinque elevatis, venis tertiariis reticulatis utrinque conspicuis, petiolulis 4 mm. longis; inflorescentiis infructescentiisque ignotis; fructibus globosis depressis interdum sublenticellatis, 4 cm. diametro, 5-ocularibus nuciformibus; endocarpio valde lignoso crasso (3.5 × 2.5 cm.) extus insculpto-vermiculato; exocarpio laxo spongioso extus glabro, nigrescente, duro; seminibus ellipsoideis, oleosis.

YUNNAN: Jenn-yeh District, Meng-pung, C. W. Wang 78978 (TYPE), Oct., 1936, in mixed woods, frequent, alt. 1200 m., seeds edible, oily.

This is the first species of the genus known from Yunnan. *Dracontomelon Dao* (Blanco) Merr. & Rolfe (*D. Duperreanum* Pierre, *D. mangiferum* sensu Forbes & Hemsl. non Blume, *D. sinense* Stapf), a species extending from Indo-China to the Philippines, Celebes, and Moluccas, is recorded from Kwangtung. This new species is easily distinguished from *D. Dao* by its larger leaflets and its much larger fruits. In this herbarium, in addition to the specimens attributed to *D. Dao*, there is a sterile specimen, *Canton Christian College 1219*, also from Kwangtung, which closely simulates *D. mangiferum* Blume. *Dracontomelon mangiferum* Blume differs from the species here described in the larger leaflets and more numerous lateral nerves and in the size of the fruits.

SAPINDACEAE

Mischocarpus Blume*Mischocarpus productus* sp. nov.

Arbor parva; foliis 8-foliolatis, circiter 30 cm. longis, glabris, rhachibus teretibus; petiolis circiter 5 cm. longis, teretibus; foliolis suboppositis coriaceis breviter petiolulatis ovato-oblongis, 11–17 cm. longis, 4–5.5 cm. latis, acuminatis, basi acutis, nervis lateralibus utrinsecus 10–12 utrinque elevatis prominulis, venis tertiariis subtiliter reticulatis utrinque elevatis distinctis; petiolulis 3–5 cm. longis; floribus ignotis; infructescentiis axillaribus parce pubescentibus vel glabrescentibus, ad 35 cm. longis, graciliter et laxe ramosis, fructibus spicatum dispositis, pedicellatis, inferne stipitatis (stipite gracili, circiter 12 mm. longo et 1 mm. crasso), superne distincte triangularibus, 6 mm. crassis, apice retusis, stylo brevi ad 1 mm. longo vel nullo, stigmatibus 3 recurvis persistentibus; pedicellis gracilibus, 5–6 mm. longis, parce pubescentibus vel glabrescentibus, sepalis 5, persistentibus triangularibus, 1 mm. longis.

YUNNAN: Ping-pien District, H. T. Tsai 60868 (TYPE), July 14, 1934, a small tree on rocky slopes, alt. 1300 m.

A species strongly characterized by the long, slenderly branched infruc-

tescences bearing relatively small but elongated fruits distinctly triangular at the upper part and narrowly elongate in the lower part, manifestly retuse at the apex with 3 persistent stigmas, which are sessile or on an exceedingly short style.

THEACEAE

Gordonia Ellis

Gordonia yunnanensis (Hu) comb. nov.

Polyspora yunnanensis Hu, Bull. Fan Mem. Inst. Biol. Bot. 8: 135. 1938.

YUNNAN: In addition to the type, *H. T. Tsai* 56805, the following numbers may be cited: *H. T. Tsai* 53540, 61773.

Anneslea Wallich

Anneslea alpina sp. nov.

Frutex 2.6-4 m. altus, omnino glaber, ramulis purpureo-brunneis, teretibus crassis, 5 mm. diametro, lenticellatis; foliis subcoriaceis, plerumque in apice ramulorum confertis, ovatis, 4-6 cm. longis, 3-4.2 cm. latis, obtusis, basi late acutis, margine subintegris, in sicco supra atro-olivaceis, subtus pallidioribus minute nigro-puncticulatis, nervis lateralibus utrinsecus circiter 6, gracilibus, utrinque subobscuris, venulis obscuris; petiolo circiter 5 mm. longo; floribus axillaribus solitariis, in apice ramulorum confertis, pedicellis 1-1.5 mm. longis; sepalis coriaceis glabris ovatis acutis, circiter 12 mm. longis et 8 mm. latis, integris; petalis membranaceis, ovato-oblongis, 16 mm. longis, 10 mm. latis; filamentis glabris 4 mm. longis, antheris oblongis, 5 mm. longis, glabris, connectivo rostrato filiformi acuminato, 3 mm. longo; ovario glabro, stylo 16 mm. longo, stigmatibus 3-lobato.

YUNNAN: Mien-ning, Po-shang, *T. T. Yü* 18031 (TYPE), Oct. 11, 1938, a shrub 8-12 ft. high, common in forests, alt. 2700 m., flowers purplish red.

A species related to *Anneslea fragrans* Wall., but distinguished by its smaller, characteristically ovate leaves, with much shorter petioles.

GUTTIFERAE

Hypericum Linnaeus

Hypericum ellipticifolium sp. nov.

Frutex 0.3 m. altus, omnino glaber, rhizomatibus subhorizontalibus, caulis singularibus erectis teretibus gracilibus rufo-brunneis simplicibus; foliis subchartaceis sessilibus ellipticis, 4-5 cm. longis, 2-3 cm. latis, rotundatis vel leviter emarginatis, basi rotundatis, in sicco olivaceis, subtus pallidioribus, nervis lateralibus utrinsecus 2 vel 3, gracilibus valde arcuato-ascendingibus, ad apicem incurvatis, supra subconspicuis, subtus distinctis, venulis tertiariis gracilibus numerosis plus minusve cum margine parallelis; inflorescentiis terminalibus umbellatis circiter 6-floris, pedunculis circiter 1 cm. longis, bracteolis minutis, acutis, vix 1 mm. longis, pedicellis circiter 8 mm. longis; sepalis oblongo-ovatis, acuminatis, circiter 7 mm. longis et 2 mm. latis; petalis obovatis 1-1.2 cm. longis, acutis; staminibus numerosis, filamentis ad 6 mm. longis; ovario ovoideo, stylis 3, liberis, 2 mm. longis; capsulis ovoideis circiter 1.1 cm. longis et 4 mm. latis, sepalis stylisque persistentibus.

YUNNAN: Taron-Taru divide, Valley of Bucahwang, *T. T. Yü* 20125 (TYPE), Sept. 4, 1938, common on mountain slopes in open grassland, flowers white.

A distinct species, strongly characterized by the elliptic leaves with delicate tertiary veins more or less parallel with the margins. The flowers are white, rather small, and in a terminal umbel.

Hypericum bellum sp. nov.

Frutex 0.3–0.6 m. altus, omnino glaber, rhizomatibus horizontalibus, caulibus erectis teretibus gracilibus rufo-brunneis, simplicibus vel e basi ramosis; foliis subchartaceis sessilibus cordato-ovatis, 3–5 cm. longis, 2–4 cm. latis, rotundatis vel submarginato-rotundatis, basi subcordatis vel cordatis, in sicco olivaceis, subtus pallidioribus, nervis lateralibus utrinsecus 2–4, adscendentibus prope marginem valde arcuato-anastomosantibus, supra subconspicuis, subtus conspicuis, venulis obscuris; inflorescentiis terminalibus umbellatis, 2- vel 3-floris, interdum unifloris, glabris, sessilibus vel pedunculatis, pedunculis ad 1.2 cm. longis, bracteis bracteolisque ovato-oblongis, ad 1.2 cm. longis et 5 mm. latis, acuminatis, pedicellis 1–2.5 cm. longis; sepalis ovatis, 5–7 mm. longis, 3–7 mm. latis, rotundatis, subrufis; petalis obovatis circiter 1.8 cm. longis et 1.3 cm. latis, rotundatis, aureis; staminibus numerosis, filamentis ad 7 mm. longis; ovario ovoideo, stylis 5 liberis 3 mm. longis; capsulis ovoideis, 1.2–1.4 cm. longis, 8–9 mm. latis, sepalis stylisque persistentibus.

YUNNAN: Eastern slopes of Likiang Snow Range, Yangtze watershed, *J. F. Rock* 10852, a shrub 1–1.5 ft. high, alt. 11000 ft., flowers yellow; Kiukiang Valley (Taron), Mt. Chingtinglaka, *T. T. Yü* 19497 (TYPE), July 28, 1938, a shrub 1–2 ft. high, common on mountain slopes in open grassland, alt. 1800–2400 m., flowers golden yellow. SIKANG: Dzer-nar, Tsa-wa-rung, *C. W. Wang* 66384, Sept., 1935, on mountain slopes, alt. 3000 m., fruit brown; Nar-jou, Tsa-wa-rung, *C. W. Wang* 66482, Sept., 1935, in pine forest, alt. 3300 m., flowers yellow.

An elegant species with large showy flowers. It is probably near *Hypericum Prattii* Hemsley, differing in the shorter, broader, and more cordate leaves, and in the fewer flowers with larger petals and shorter filaments.

Ochrocarpus Thouars

Ochrocarpus yunnanensis sp. nov.

Arbor circiter 17 m. alta, omnino glabra, ramulis teretibus luteo-brunneis subnitidis, ultimis 6 mm. diametro; foliis breviter petiolatis coriaceis oblongo-lanceolatis, 20–24 cm. longis, 6–7 cm. latis, acutis vel rotundatis, basi acutis, leviter rotundato-auriculatis, leviter revolutis, in sicco olivaceis utrinque subconcoloribus, costa crassa supra prominente, subtus valde elevata, venis primariis circiter 30–35 valde obscuris, patentibus, in trabecularum reticulo confertissimo fere occultatis; petiolis 5–8 mm. longis, crassis, supra distincte canaliculatis; floribus ignotis; fructibus magnis ovoideis, 5.5–6 cm. longis, 3–3.5 cm. diametro, acutis, basi leviter constrictis, in sicco atro-brunneis, subconspicue et graciliter striatis, pedicellis saltem 1 cm. longis, seminibus singularibus ovoideis, 3.8–4.5 cm. longis, 2.2–2.4 cm. latis, utrinque rotundatis.

YUNNAN: Jenn-yeh District, Meng-pung, *C. W. Wang* 78973 (TYPE), Oct., 1936, a tree 50 ft. high, 2 ft. in diameter, cultivated, alt. 760 m., Tai name: "long sol-pee."

The genus *Ochrocarpus* has not previously been reported from China. This species is allied to *O. siamensis* T. Anders., differing in the much larger size and the stouter branchlets, the longer and sometimes acute leaves, which

are rounded and slightly auriculate at their bases, and the larger fruits. The lateral veins of the leaves are very numerous and are conspicuous on both surfaces; they are very slender and are united by numerous veinlets forming a delicate network, being hardly distinguishable from each other. From *O. Harmandii* Pierre the new species can be differentiated especially by the much shorter petioles, and by the leaf-bases being rounded and slightly auriculate instead of cordate. This tree is cultivated in temple grounds of the Tai aborigines. Only detached fruits were collected, but the field label states that the tree blooms in April and has very fragrant white flowers.

FLACOURTIACEAE

Bennettiodendron Merrill

Bennettiodendron lanceolatum sp. nov.

Frutex 2 m. altus, ramulis teretibus pubescentibus; foliis membranaceis longe petiolatis lanceolatis, 14–18 cm. longis, 2–3 cm. latis, longe acuminatis, basi anguste rotundatis, margine remote serratis (dentibus prominulis longe triangularibus plus minusve papillatis ad 2 mm. longis obtusis), supra atro-viridibus glabris, subtus viridibus parce pubescentibus, costa venisque supra conspicuis, subtus valde perspicuis, nervis lateralibus utrinsecus 8–10 valde arcuato-adscentibus prope marginem coalitis, venulis reticulatis utrinque perspicuis; petiolis ad 4 cm. longis pubescentibus; floribus ignotis; infructescentiis axillaribus vel terminalibus paniculatis circiter 1 cm. longis, pubescentibus, pedunculis 2–3 cm. longis, pedicellis 5 mm. longis, lenticellatis, fructibus globosis 1 cm. diametro, 1-locularibus, glabris atro-brunneis.

KWEICHOW: Wong-moo, Chen-feng, *S. W. Teng* 90993 (TYPE), Sept. 20, 1936, a shrub 6 ft. high, in dense mixed woods.

This species is strongly characterized by its long-petiolate, narrowly lanceolate, long-acuminate leaves, which are pubescent on the petioles and the under surface, and which have very prominent, somewhat papillate, remote, obtuse serrations.

THYMELAEACEAE

Wikstroemia Endlicher

Wikstroemia Domkeana nom. nov.

Daphne gracilis E. Pritz. Bot. Jahrb. 29: 480. 1900; Nitsche, Beitr. Kenntn. Daphne 28. 1907; Rehd. in Sargent, Pl. Wils. 2: 548. 1916.

Wikstroemia gracilis Domke, Notizbl. Bot. Gart. Berlin 11: 362. 1932, non Hemsley, 1849.

SZETCHUAN.

MELASTOMATACEAE

Blastus Loureiro

Blastus Tsaii nom. nov.

Blastus yunnanensis Li, Jour. Arnold Arb. 25: 15. 1944, non H. Lév. 1912.

In recently proposing a new species from Yunnan based on *H. T. Tsai* 60813, I overlooked the fact that H. Léveillé had previously described a *Blastus yunnanensis* in 1912, which is the basis of *Bredia yunnanensis* (H. Lév.) Diels. In the synonymy of this latter species, I erroneously cited

Léveillé's binomial as *Bredia yunnanensis* H. Lév. (op. cit. 24) rather than *Blastus yunnanensis* H. Lév.

Medinilla Gaudichaud

Medinilla yunnanensis Li, Jour. Arnold Arb. 25: 39. 1944.

Two collections cited as representing this species were erroneously listed as *A. Henry* 10275 and 10275A; these numbers actually are *A. Henry* 12075 (type) and 12075A.

CORNACEAE

Helwingia Willdenow

Helwingia himalaica Hook. f. & Thomson, var. *crenata* (Lingelsh.) comb. nov.

Helwingia crenata Lingelsh. ex Limpricht, Repert. Sp. Nov. Beih. 12: 453. 1922; Hand.-Maz. Symb. Sin. 7: 688. 1933; Chun, Sunyatsenia 4: 246. 1940.

YUNNAN: Wei-si District, Kan-pu, C. W. Wang 64128, July, 1935. Szechuan, Hunan, Kwangtung.

The type was collected by Limpricht at Kuan Hsien, Szechuan (*Limpricht* 1286A, April, 1904); fragments and a photograph of this are in the herbarium of the Arnold Arboretum. Among the Chinese specimens of this variety, in addition to the Yunnan specimen cited above, are *F. T. Wang* 20545, 22880, and *T. S. Wen* 534 from Szechuan, and *Handel-Mazzetti* 539 = 11868 from Hunan, which manifestly represent the same form, but *Wang-Te-Hui* 121 from Hunan and *W. P. Fang* 1334 and *Y. Tsiang* 4966 from Kweichow have the leaves not at all crenate and thus should not be included in this concept, as cited by Handel-Mazzetti.

Wangerin (Pflanzenr. 41 [IV. 229]: 37. 1910) treats the genus *Helwingia* as having three species, but I fail to notice clear-cut specific differences between them, especially between *H. chinensis* Bat. and *H. himalaica* Hook. f. & Thomson. Both are variable and widely distributed. As noted by Merrill in his statement regarding *H. himalaica* var. *stenophylla* (Brittonia 4: 137. 1941), the two varieties here described which represent the extreme forms might with equal propriety be placed under *Helwingia chinensis* Bat.

Helwingia himalaica Hook. f. & Thomson, var. *stenophylla* Merr. Brittonia 4: 137. 1941.

YUNNAN: Suen-oui, *E. E. Maire* 444; Pe-yen-tsin, *Siméon Ten* 127, May, 1916; no data, *G. Forrest* 9828, *H. T. Tsai* 57590A; Pin-chuan District, *H. T. Tsai* 52908, July, 1933; Ho-kin, Luho near Sung-kwei, *K. M. Feng* 863, April, 1939. Upper Burma; new to Yunnan.

Helwingia himalaica Hook. f. & Thomson, var. *parvifolia* var. nov.

A typo speciei recedit foliis ovato-lanceolatis, longe attenuatis, basi attenuatis, 2–5 cm. longis et 0.5–1.2 cm. latis.

YUNNAN: Mountains of Londjre, Mekong-Salween watershed, *J. F. Rock* 8871 (TYPE), in 1923; Kunming, C. W. Wang 62996, April, 1935; Sung-tsu-yuan, Chen-kiang, *H. Wang* 41451, June, 1939.

Aucuba Thunberg

Aucuba chinensis Benth. forma *subintegra* f. nov.

A typo speciei recedit foliis ovatis, apice rotundatis, margine integris,

raro dentibus paucis mucronulatis apicem versus praeditis, 14–18 cm. longis et 6–8 cm. latis.

YUNNAN: Mong-ka, *H. T. Tsai 56310* (TYPE), Feb., 1934.

Cornus Linnaeus

Cornus oblonga Wall. forma *pilosula* f. nov.

A typo speciei differt foliis maturis supra subglabratiss, subtus dense pilosulis.

YUNNAN: Mi-le District, *A. Henry 9930*; Lo-ping, Bentijian, *H. Handel-Mazzetti 10163*, Nov., 1917; mountains south of Likiang, near Ho-ching and Chiu-ho, *J. F. Rock 4069*, May, 1922; Lu-se, *H. T. Tsai 56983* (TYPE), Feb., 1934; Wei-si District, *H. T. Tsai 59994*, Nov., 1934; no data, *T. T. Yü 8162*; Meng-hau, Hsia-chi-chang, *T. T. Yü 15841*, May, 1938; southern Chungtien, Chiao-tou on the bank of the Yangtze River, *K. M. Feng 3077*, Oct., 1939.

Tsai 56983 and *59994* have their leaves very densely hairy beneath, while the other specimens have leaves slightly less so. Among the Szechuan specimens of the species, *T. T. Yü 757, 1613*, and *Y. S. Liu 2126* apparently represent the same form.

Cornus macrophylla Wall. in Roxb. Fl. Ind. 1: 433. 1820; Hemsl. Kew Bull. 1909: 330. 1909; Wang. Pflanzenr. 41 (IV. 229): 71. 1910; Rehd. in Sargent, Pl. Wils. 2: 575. 1916; Hand.-Maz. Symb. Sin. 7: 689. 1933.

Cornus alosiphila W. W. Smith, Notes Bot. Gard. Edinb. 10: 19. 1917, syn. nov.

This is a common species, ranging from the Himalayan region through western and central China to Korea and Japan. As has been noticed by Rehder (l. c.), the shape of the style in *Cornus macrophylla* Wall. and related species, upon which much stress is laid by Koehne and by Wangerin, is quite variable. *Cornus alosiphila* W. W. Smith (Yunnan: on Tong-shan in the Yangtze bend, *G. Forrest 11176* [isotype, A]) is described as having a cylindric style, but an examination of an isotype in the herbarium of the Arnold Arboretum reveals a slight enlargement of the style at its apex like that of *C. macrophylla* Wall. As it is not distinguishable from the latter by other characters, a reduction seems desirable.

Cornus kweichowensis sp. nov. Subgen. *Thelycrania*, § *Amblycaryum*.

Arbor 10 m. alta, ramulis novellis gracilibus adpresse strigosis vel glabratiss; foliis oppositis petiolatis chartaceis ovatis vel oblongo-ovatis, 5–8 cm. longis, 2–4 cm. latis, longe acuminatis, basi cuneatis, supra viridibus plus minusve dense adpresseque strigosis, subtus pallide viridibus dense adpresseque strigosis, nervis lateralibus utrinsecus 2 vel 3, arcuatim adscendentibus, supra subconspicuis, subtus elevatis prominentibus, venis tertiariis utrinque conspicuis; petiolis adpresse strigosis, 0.7–1.2 cm. longis; inflorescentiis dense corymbosis terminalibus circiter 5 cm. longis, 4–7 cm. latis, omnino adpresse strigosis, pedunculis 2–2.5 cm. longis, pedicellis brevibus, 0.5–1.5 mm. longis, floribus albis, 5 mm. diametro, calyce dense strigoso, 1.5 mm. longo, margine distincte 4-dentato, dentibus triangularibus, 0.5 mm. longis; petalis 4 lanceolatis acutis, 2.5 mm. longis, 1 mm. latis, extus puberulis, intus glabris; staminibus 4, filamentis 2 mm. longis; ovario 2-loculari, stylo sparse adpresseque puberulo toto cylindrico crasso longitudinaliter striato, 2 mm. longo; fructu ignoto.

KWEICHOW: Hsu-feng, Tsa-Swee, *S. W. Teng* 90577 (TYPE), July 13, 1936, a tree 30 ft. high, in dense woods, flowers white.

This species is characterized by the more or less dense appressed-strigose hairs on both surfaces of the leaves, the few (2 or 3 on each side) lateral nerves, and the rather stout, cylindric, longitudinally grooved styles. According to Wangerin's arrangement, this species falls in the subgenus *Thelycrania* Endl., Sect. *Amblycaryum* Koehne, Subsect. *Nigrae* Koehne. It is related to *Cornus poliophylla* C. K. Schneider & Wang. and *C. Monbeigii* Hemsl., but is distinguished from both by the characters indicated above.

Cornus yunnanensis sp. nov. Subgen. *Thelycrania*, § *Amblycaryum*.

Arbor circiter 5 m. alta, ramulis novellis pilosulis mox glabratiss; foliis oppositis petiolatis chartaceis late ovatis vel ovato-ellipticis, 9–11 cm. longis, 4–5.5 cm. latis, longe acuminatis, basi late cuneatis vel subrotundatis, supra glabratiss, subtus parce pilosulis vel subglabratiss, nervis lateralibus utrinsecus circiter 4, arcuatim adscendentibus, supra paullo impressis, subtus prominentibus, venis reticulatis utrinque inconspicuis, supra leviter impressis; petiolis parce pilosulis vel glabratiss, 1.5–2 cm. longis; inflorescentiis 2.5 cm. longis, 3.5 cm. latis, in ramulis axillaribus brachyblastis totis plus minusve pubescentibus, circiter 1 cm. longis, corymbosis, pedunculis brevibus, 0.5 cm. longis, pedicellis 1–1.5 cm. longis; calyce dense pilosulo, 1 mm. longo, margine leviter 4-dentato; petalis 4, lanceolatis, 3 mm. longis, 1 mm. latis, extus puberulis, intus glabris; staminibus 4, filamentis 2.5 mm. longis; ovario 2-loculari, stylo glabro, 3 mm. longo, apice clavato, stigmate depresso capitato; fructu ignoto.

YUNNAN: Southern Chungtien, between Zer-I and Kai-lou-wai on the banks of the Yangtze River, *K. M. Feng* 3410 (TYPE), Nov., 1930.

This species is near *Cornus macrophylla* Wall., from which it differs in the fewer lateral nerves and the small short-pedicellate flowers, which are more or less crowded in very small corymbs produced on short axillary branches.

STYRACACEAE

Styrax Linnaeus

Styrax rugosus Kurz, Jour. Asiat. Soc. Beng. 40(2): 61. 1871, Forest Fl. Brit. Burma 2: 141. 1877; C. B. Clarke in Hook. f. Fl. Brit. Ind. 3: 589. 1882; Perkins, Pflanzenr. 30 (IV. 241): 78. 1907.

YUNNAN: Fo-hai, *C. W. Wang* 74113, May, 1936, a woody plant, 20 ft. high, in mixed forests, alt. 1540 m., flowers white, 77088, June, 1936, 3 m. high, in thickets, alt. 1400 m.; Nan-chiao, *C. W. Wang* 75068, June, 1936, a woody plant 10 ft. high, in forests, alt. 1350 m., 75198, June, 1936, a woody plant 5 ft. high, in forests, flowers white. India and Burma; new to Yunnan and to China.

Styrax chrysocarpus sp. nov.

Arbor 7–20 m. alta, ramulis novellis dense brunneo-tomentosis vel glabrescentibus; foliis chartaceis breviter petiolatis, supra scabride stellato-tomentosis, subtus stellato-tomentosis, plus minusve scabridis, oblongo-ovatis, 10–20 cm. longis, 5.5–11 cm. latis, acuminatis, basi rotundatis, margine integris, nervis lateralibus utrinsecus 5–10 supra subconspicuis cum costa dense tomentosis, subtus elevatis distinctis, venis tertiariis supra

inconspicuis subtus prominulis; petiolis 5-8 mm. longis, dense tomentosus; infructescentiis axillaribus brevibus oligocarpis dense tomentosis, floribus ignotis; fructibus ovoideis, circiter 1.8 cm. longis et 1.2 cm. diametro, apice leviter mucronatis, extus dense flavido-tomentosis; calyce persistente cupuliformi membranaceo brunneo, circiter 6 mm. longo, parce stellato-tomentoso, margine irregulariter lobato; pedicello brevi, circiter 4 mm. longo, dense tomentoso.

YUNNAN: Ping-pien District, *H. T. Tsai* 62505 (TYPE), July 9, 1934, a tree 25 ft. high, in ravines, alt. 1400 m., 62522, July 11, 1934, a tree 20 ft. high, on open slopes, alt. 1400 m., 62766, July 18, 1934, a tree 60 ft. high, in ravines, alt. 1500 m.

A species characterized by its rather large, oblong-ovate leaves, more or less scabrid-hairy on both surfaces, the bright yellow tomentose fruits, and the membranaceous calyx.

Alniphyllum Matsumura

Alniphyllum Eberhardtii Guillaum. Bull. Soc. Bot. France 70: 885. 1923.

YUNNAN: Ping-pien District, *H. T. Tsai* 60533, June 28, 1934, in woods, alt. 1400 m., 61240, June 26, 1934, a tree 30 ft. high, alt. 1000 m., in ravines, 61511, Aug. 17, 1934, a small tree, 20 ft. high, alt. 1200 m., on open slopes. Indo-China; new to Yunnan.

OLEACEAE

Linociera Swartz

Linociera longiflora sp. nov. § *Ceranthus*.

Arbor parva circiter 10 m. alta, glabra vel subglabra, ramis pallide brunneis glabris, consperse lenticellatis, ramulis junioribus castaneis, leviter pubescentibus; foliis chartaceis, oblongo-ovatis, ad 15 cm. longis et 6.5 cm. latis, acuminatis, basi attenuatis, margine integris, in sicco pallide olivaceis, utrinque concoloribus, glabris vel junioribus supra minutissime lepidotulis, nervis lateralibus utrinsecus circiter 8, arcuato-anastomosantibus, supra distinctis, subtus elevatis, venis tertiariis reticulatis laxis utrinque conspicuis; petiolo circiter 3.5 cm. longo, glabro; inflorescentiis axillaribus glabris, 6-9 cm. longis, distincte pedunculatis (pedunculis ad 3 cm. longis); bracteis bracteolisque lanceolatis acuminatis, 2-4 mm. longis; floribus perfectis, circiter 7 mm. longis, breviter (1 mm.) pedicellatis; sepalis ovatis obtusis, circiter 1.5 mm. longis; petalis liberis vel deorsum connatis, lanceolatis, revolutis, circiter 7.5 mm. longis et 1.5 mm. latis, sursum vix angustatis, obtusis; filamentis brevibus, 0.5 mm. longis, antheris ellipsoideis, 2 mm. longis, apice appendiculis 1 vel 2 ad 0.5 mm. longis praeditis; ovario ovoideo, glabro, circiter 1 mm. longo, stylo 1 mm. longo, stigmatе capitato.

YUNNAN: Field notes not available, *H. T. Tsai* 55863 (TYPE), 1933; Chen-kang District, *C. W. Wang* 72273, March, 1936, a tree 30 ft. high, on mountain slopes, alt. 1700 m., flowers yellow.

This species is characterized by its long petals and the more or less elongated appendages on the anther-tips, usually in pairs but sometimes only one developed. It probably belongs in the alliance of *L. ramiflora* (Roxb.) Wall., but evidently is not very closely related to that species.

Linociera Henryi sp. nov. § *Ceranthus*.

Arbor parva 5-7 m. alta, glabra vel subglabra, ramis glabris pallide

brunneis, distincte lenticellatis, ramulis ultimis subcastaneis, minute tomentellis; foliis amplis coriaceis obovato-lanceolatis 18–33 cm. longis, 6–10.5 cm. latis, acuminatis, basi longe attenuatis, margine integris, in sicco olivaceo-brunneis, subtus tomentellis, nervis lateralibus utrinsecus 12–15, subpatulis, distantibus, marginem versus curvatis, obscure arcuato-anastomosantibus, supra leviter impressis, subtus distinctis, reticulis laxis, utrinque obscuris; petiolo 2.5–4 cm. longo, glabro; inflorescentiis axillaribus vel subterminalibus, longe pedunculatis (pedunculis 2–3.5 cm. longis), paniculatis, cum pedunculis ad 15 cm. longis; floribus hermaphroditis, subaxe dispositis, sessilibus vel subsessilibus, bracteis lanceolatis, minutis, 2–3 mm. longis; sepalis oblongo-ovatis, acuminatis, circiter 1.5 mm. longis, extus pubescentibus; petalis albidis sublimeris vel deorsum minute connatis, oblongis, extus leviter pubescentibus vel glabris, circiter 3 mm. longis et 1.5 mm. latis, apice longe acuminatis; filamentis brevissimis, 0.5 mm. longis, crassis, antheris ellipticis vel oblongo-ellipticis, 1 mm. longis; ovario ovoideo, stylo 0.5 mm. longo, stigmate capitato; fructibus ovoideis angustis glabris, ad 5 cm. longis et 2.5 cm. latis.

YUNNAN: Szemao, eastern mountains, *A. Henry 12042* (TYPE), a tree 20 ft. high, alt. 4500 ft.; Szemao, eastern forests, *A. Henry 12236*, a tree 15 ft. high, alt. 4500 ft., flowers white; same locality, *A. Henry 12236A*, a tree 15 ft. high, alt. 4000 ft., in fruit; Ping-pien District, *H. T. Tsai 60578*, June 29, 1934, a shrub 12 ft. high, in ravines, alt. 1200 m., flowers green; Che-li District, Meng-soong, Dah-meng-lung, *C. W. Wang 78387*, Sept., 1936, 8 m. high, in mixed forests, alt. 1900 m., fruit green.

This species is closely allied to *Linociera Thorelii* Gagnep., particularly in the acuminate sepals and petals. However, it differs from this in the larger, more distinctly obovate leaves, with generally fewer nerves and relatively shorter petioles. It also has longer panicles, and, of more importance, capitate instead of divergent stigmas.

Olea Linnaeus

Olea laxiflora sp. nov.

Frutex glaber circiter 2.5 m. altus; foliis chartaceis petiolatis oblongo-ovatis, 9–13 cm. longis, 2.5–4 cm. latis, longe acuminatis (acumine 2 cm. longo), basi longe acutis, margine integris, in sicco utrinque concoloribus olivaceis, costa supra leviter depressa, subtus valde elevata, nervis lateralibus utrinsecus 8–12, utrinque subconspicuis, venis tertiariis obscuris; petiolis 1–1.5 cm. longis, supra valde canaliculatis; inflorescentiis paniculatis axillaribus gracilibus laxifloris, circiter 6.5 cm. longis, pedunculis 2 cm. longis, pedicellis 6–10 mm. longis, gracilibus, floribus ♂ solis visis: calycibus 1–1.5 mm. longis, profunde 4-lobatis, lobis ovato-acuminatis, margine leviter ciliatis; corollae tubo 2 mm. longo, 4-lobato, lobis triangularibus, rotundatis, 1 mm. longis; staminibus 2, subhypogynis, filamentis 0.5 mm. longis, antheris oblongis, 0.75 mm. longis; floribus perfectis ignotis.

YUNNAN: Taron-Taru Divide, Tang-teh-wang, *T. T. Yü 20988* (TYPE), Nov. 7, 1938, a shrub 8 ft. high, in mixed forests, casual, alt. 2200 m., flowers white.

This is a dioecious or polygamo-dioecious, wholly glabrous species. It is probably near *Olea yunnanensis* Hand.-Maz., but is distinguished by its long-acuminate leaves and its lax inflorescences with slender pedicels.

Olea densiflora sp. nov.

Frutex 2–7 m. altus, ramulis junioribus dense pubescentibus; foliis

chartaceis petiolatis oblongo-ovatis vel oblongo-lanceolatis, 10-14 cm. longis, 3-5 cm. latis, longe acuminatis, margine paucè denticulatis vel integris, in sicco olivaceis utrinque subconcoloribus, supra glabris, subtus dense pubescentibus, costa supra impressa, subtus valde elevata, nervis lateralibus utrinsecus 6-10, supra leviter impressis, subtus subconspicuis, venis tertiariis obscuris; petiolis 0.5-1 cm. longis, pubescentibus; inflorescentiis axillaribus vel terminalibus, pubescentibus, floribus polygamodioicis; inflorescentiis ♂ longe paniculatis, ad 20 cm. longis, bracteis oblongis, ad 8 mm. longis, floribus plus minusve confertis minutis, pedicellis gracilibus 2 mm. longis, calycibus 4-lobatis, circiter 1 mm. longis, corolla 1.5 mm. longa, 4-lobata, lobis rotundatis, minutis, antheris 1 mm. longis; inflorescentiis ♀ paniculatis, 2-3 raro ad 10 cm. longis, floribus plus minusve confertis, minutis, pedicellis 1 mm. longis, calycibus 4-lobatis, circiter 1 mm. longis, corolla 3 mm. longa, 4-lobata, lobis rotundatis minutis, antheris 1 mm. longis, ovario glabro, stylo brevi, stigmatibus leviter 2-lobatis; fructibus ellipsoideis, circiter 1.2 cm. longis et 6 mm. latis.

YUNNAN: Szemao, *A. Henry* 11661 (♂), 11661A, 11661B, 11661C, 11661E, a shrub 5-10 ft. high, alt. 4500-5000 ft., flowers white, *A. Henry* 12598 (fruit), a shrub 10 ft. high, in forests, alt. 4000 ft.; between Keng Hung and Muang Hing, *J. F. Rock* 2667 (♂), 2706 (♂), Feb. 25 - March 1, 1922, a shrub or tree to 20 ft. high, on dry ridges, alt. 4000 ft.; between Muang Hing and Szemao, *J. F. Rock* 2749 (♀, TYPE), 2797 (♂), March 2-12, 1922, a shrub 8-10 ft. high, on dry hills, flowers yellow; Fo-hai, *C. W. Wang* 73504 (♀), 73602 (sterile), 73826 (♀), 77136 (young fruits), May, 1936, a shrub 5-16 ft. high, in mixed forests, alt. 1400-1530 m.; Nan-chiao, *C. W. Wang* 75151 (young fruits), 75173 (young fruits), June, 1936, a shrub 6-7 ft. high, in forests, alt. 1380 m.; Che-li District, *C. W. Wang* 75689 (fruits), Aug., 1936, a shrub 2-2.5 m. high, in mixed forests, alt. 1050-1400 m.; Jenn-yeh District, Meng-la, *C. W. Wang* 80702 (fruits), 80703 (sterile), Nov., 1936, a shrub 10-20 ft. high, alt. 850 m.

This is a polygamodioecious species with long staminate and short hermaphrodite panicles. From *Olea dioica* Roxb. it is readily distinguished by its pubescence and the presence of a corolla in the perfect flowers. It is apparently close to *Olea dentata* Wall., but can be distinguished by the very unequal staminate and hermaphrodite panicles, the smaller, often entire, and distinctly pubescent leaves, and the smaller flowers.

VERBENACEAE

Clerodendron Linnaeus

Clerodendron Tsaii sp. nov.

Frutex 2-7 m. altus, ramulis dense pubescentibus; foliis chartaceis petiolatis, cordato-ovatis vel ovato-oblongis, 10-19 cm. longis, 5.5-13 cm. latis, acuminatis, basi truncatis vel cordatis, margine integris, supra parce subtus dense pubescentibus, venis lateralibus utrinsecus 4-6 subconspicuis, rete venularum obscuro; petiolis cylindricis, 3-7.5 cm. longis, dense pubescentibus; inflorescentiis cymosis terminalibus ad 11 cm. longis, dense pubescentibus, pedunculis 1.5-3 cm. longis, bracteis lanceolatis acuminatis, 4-5 mm. longis, caducis, pedicellis 1 mm. longis; calycibus 3.5-4 mm. longis, dense pubescentibus, perspicue glandulosis, 5-dentatis, dentibus linearibus acuminatis, 1 mm. longis; corollae tubo 8-9 mm. longo, 0.5 mm. lato, subglabro, 5-lobato, lobis oblongo-ovatis, 3 mm. longis, 2 mm. latis, extus parce pubescentibus; staminibus 7-8 mm. exsertis; stylis 4-5 mm.

exsertis, stigmatē minute 2-lobato; fructibus ovoideis, 5–8 mm. longis, 4–7 mm. latis, calycibus accrescentibus, 5–7 mm. longis.

YUNNAN: Ping-pien District, *H. T. Tsai* 61055, July 20, 1934, 61410, Aug. 5, 1934, 61673, Aug. 25, 1934, 61748 (TYPE), Sept. 1, 1934, 61826, Sept. 5, 1934, 61863, Sept. 3, 1934, a shrub or small tree 6–30 ft. high, on open slopes or in ravines, alt. 1300–1400 m., flowers white.

In its pubescence, this species is probably close to *Clerodendron viscosum* Vent., but it is distinguished by the much smaller flowers with the calyces shorter than the fruits and by the very early caducous bracts and bracteoles. The flowers are not infrequently hypertrophied, apparently due to the presence of certain insects, with the corolla tubes enlarged to 2 cm. in length.

BIGNONIACEAE

Millingtonia Linnaeus f.

Millingtonia hortensis Linn. f. Suppl. 291. 1781.

YUNNAN: Che-li District, Mong-hain or Gan-lan-ba, *C. W. Wang* 79856, Oct., 1936, 8 ft. high, in thickets, alt. 800 m., flowers light greenish yellow; Che-li District, Sheau-meng-yeang, *C. W. Wang* 81011, Oct., 1936, 8 m. high, alt. 900 m., flowers white; Jenn-yeh District, Lung-huk, *C. W. Wang* 80113, a tree 50 ft. high, in forested ravines, alt. 980 m., flowers pinkish yellow. Indo-China, Siam, India, Malaysia; new to China.

Wightia Wallich

Most authors include the genus *Wightia* in the Scrophulariaceae, but the proper position for the genus is in the Bignoniaceae. Hallier (Bull. Herb. Boiss. II. 3: 181–207. 1903) has clearly demonstrated that the genera *Wightia* and *Paulownia* should be removed from the Scrophulariaceae to the Bignoniaceae. More recently Campbell (Bull. Torrey Bot. Club 57: 47–50. 1930) reached the same conclusions for *Paulownia*, although he apparently overlooked Hallier's earlier statement.

Wightia speciosissima (D. Don) Merr. Jour. Arnold Arb. 19: 67. 1938.

Gmelina speciosissima D. Don, Prodr. Nepal. 104. 1825.

Wightia gigantea Wall. Pl. As. Rar. 1: 71. t. 81. 1830.

YUNNAN: No precise locality, *G. Forrest* 18801, 1917–19; Yun-lung District, *H. T. Tsai* 54557, Sept. 25, 1933, a small tree 20 ft. high, in ravines, alt. 2100 m., flowers dark pink; Mien-ning, Hopientsun, *T. T. Yü* 18157, Nov. 2, 1938, a tree 15–20 ft. high, common in forests, alt. 2000 m., flowers pink; Kiukiang Valley, west of Kungsian, *T. T. Yü* 20512, Sept. 28, 1938, a tree 20–30 ft. high, common in forests, alt. 1250 m., flowers pink. India, Burma, Indo-China. The genus and species are new to China.

Wightia elliptica Merr. Jour. Arnold Arb. 19: 66. 1938.

YUNNAN: Yung-chou, Changpoling, *T. T. Yü* 18222, Nov. 16, 1938, a tree 20–25 ft. high, rare along the margins of rice fields, alt. 1550 m., flowers purplish pink. Indo-China; new to China.

RUBIACEAE

Hymenopogon Wallich

Hymenopogon oligocarpus sp. nov.

Frutex circiter 2 m. altus, ramulis tortuosis cicatricosis glabris, foliis juvenilibus in apice ramulorum confertis; foliis membranaceis petiolatis elliptico-lanceolatis, 10–15 cm. longis, 3–5 cm. latis, longe acuminatis, basi

attenuatis, margine integris, supra viridibus, subtus subalbis, utrinque laxè pubescentibus pilis praesertim in costa nervisque dispositis, nervis lateralibus utrinsecus 7-9, utrinque distinctis, oblique adscendentibus prope marginem arcuatim anastomosantibus, venis tertiariis utrinque subconspicuis; petiolis 1-1.5 cm. longis, pubescentibus; floribus ignotis; infructescentiis corymbosis terminalibus, rhachibus pubescentibus, circiter 5.5 cm. longis, gracilibus trichotomis, pedunculis circiter 1 cm. longis, pubescentibus, fructus 1 vel 2 gerentibus, ad basim bracteatis, bracteis triangulari-ovatis acutis, circiter 2 mm. longis, pedicellis 0.5-1 cm. longis, bracteis inferioribus saepe accrescentibus subpetaloideis petiolatis oblongis, circiter 3.5 cm. longis et 1 cm. latis, attenuatis acutis, nervis 8-jugis, petiolis circiter 2.5 cm. longis gracilibus; fructibus capsularibus glabris turbinatis, circiter 1 cm. longis et 5 mm. crassis, membranaceis, septicide 2-valvis, calycis lobis persistentibus triangulari-ovatis, 5 mm. longis, acutis; seminibus multis linearibus utrinque acute alatis, circiter 6 mm. longis, nigris.

YUNNAN: Taron-Taru Divide, Lung-nan, *T. T. Yü 20026* (TYPE), Aug. 28, 1938, a shrub 6 ft. high, in forests, alt. 2400 m., rare.

A new species in this small genus, strongly characterized by its membranaceous, few-nerved leaves and the rather small, few capsules.

Adina Salisbury

Adina pilulifera (Lam.) Franch. var. *tonkinense* (Pitard) Merr. in herb. comb. nov.

Adina globiflora Salisb. var. *tonkinense* Pitard in Lecomte, Fl. Gén. Indo-Chine 3: 39. 1922.

KWANGSI: Chuen Yuen, *Z. S. Chung 81999*, June 18, 1937, a small tree in woods, along streams, flowers yellowish; Ling-wan District, *S. K. Lau 28480*, July 5, 1937, a shrub 4 m. high, in dense woods. YUNNAN: Wen-shan District, *H. T. Tsai 51606*, Jan. 22, 1933, *51724*, Feb. 10, 1933, a tree 25-30 ft. high, in forests, alt. 2000 m.; Ping-pien District, *H. T. Tsai 60253*, June 17, 1934, *60482*, *60486*, June 29, 1934, *62129*, June 2, 1934, *62246*, June 4, 1934, a shrub or small tree, 10-30 ft. high, in ravines, alt. 1400 m.; Mengtze, *A. Henry 13466*, southeastern mountains, a tree 40 ft. high, alt. 6000 ft. Tonkin, Hainan; new to continental China.

Adina mollifolia Hutchinson in Sargent, Pl. Wils. 3: 391. 1916.

Adina asperula Hand.-Maz. Anz. Akad. Wiss. Wien 58: 232. 1921, Symb. Sin. 7: 1018. 1936, syn. nov.

SZECHUAN: Between Telipin and Yalung, *C. Schneider 136*, May 8, 1914. YUNNAN: Beyendjing, *Handel-Mazzetti 6301*, May 13, 19, 1915; Szemao, *A. Henry 11888*, *12852*; Talang, *A. Henry 13265*.

The type of *A. asperula* Hand.-Maz. is *S. Ten 218*, which I have not seen. *Handel-Mazzetti 6301* is from the type locality of *A. asperula* and is cited (Symb. Sin. 7: 1018. 1936) by him as representing that species. The heads are slightly smaller than are those of *A. mollifolia* Hutchinson as represented by *Henry 11888*, the type, and other specimens, but they are also younger. Otherwise it cannot be distinguished from *A. mollifolia*, nor does *Handel-Mazzetti's* original description reveal any noticeable difference. A new record for Szechuan.

Anthocephalus A. Richard

Anthocephalus indicus A. Rich. Mém. Soc. Hist. Nat. Paris 1834: 237. 1834; Pitard in Lecomte, Fl. Gén. Indo-Chine 3: 32. 1922.

YUNNAN: Che-li District, Sheau-meng-yeang, *C. W. Wang* 75585, Aug., 1936, 79612, Sept., 1936, a tree 40 ft. high, in forests, alt. 910–1000 m.; Che-li District, Dah-meng-lung, *C. W. Wang* 77417, Aug., 1936, a large tree 30 m. high, frequent in dense forests; Jenn-yeh District, Meng-hing, *C. W. Wang* 80024, Nov., 1936, a tree 40 ft. high, in woods, alt. 850 m.; Jenn-yeh District, Meng-la, *C. W. Wang* 80791, Nov., 1936, 40 ft. high, in mixed woods, alt. 900 m.; Luh-shuen District, Maan-tsang, Sheau-meng-yeang, *C. W. Wang* 81077, Nov., 1936, 15 m. high, in thickets, alt. 800 m. India, Ceylon, Malay Peninsula, Sumatra, Borneo, Siam, Indo-China; new to China.

Anthocephalus indicus A. Rich. var. *glabrescens* var. nov.

A typo speciei differt foliis subtus glabrescentibus.

YUNNAN: Che-li District, *C. W. Wang* 78648 (TYPE), Sept., 1936, a tree 35 ft. high, in mixed forests, alt. 1000 m.

Mussaenda Linnaeus

Mussaenda Hossei Craib, Kew Bull. 1911: 388. 1911.

Mussaenda Rehderiana Hutchinson in Sargent, Pl. Wils. 3: 397. 1916, syn. nov.

SIAM: Pass of Doi Nang Keo, *J. F. Rock* 1576, Dec. 31, 1921; between Meh Soi and Hue San, *J. F. Rock* 1839, Jan. 5, 1922; Doi Chang Mountain, near Hue San, *J. F. Rock* 1717, Jan. 10, 1922; in deep forest near Ba Meh Ki near Meh Cham, *J. F. Rock* 1896, Jan. 18, 1922. YUNNAN: In forest of Pang Khun, between Keng Hung and Muang Hing, *J. F. Rock* 2591, Feb. 25–March 1, 1922; Szemao, mountains to the south, *A. Henry* 11790 (type of *M. Rehderiana* Hutchinson).

Craib's type was from Chiangmai, northern Siam, whence Rock's specimens came; these closely match Craib's description. Rock's and Henry's Yunnan specimens unquestionably represent the Siamese species originally described by Craib.

Tarenna Gaertner

Tarenna depauperata Hutchinson in Sargent, Pl. Wils. 3: 411. 1916.

KWEICHOW: Cheng-feng, Gen-Kai, *S. W. Teng* 91044, Sept. 24, 1936, a shrub 4 ft. high, in shady places. KWANGSI: Sui-luk District, southwest of Nanning, mountains surrounding Pa Lau Village, *W. T. Tsang* 21901, March 1–18, 1933, 5 ft. high, in forests, fairly common on dry steep slopes, sandy soil; flowers yellow. Previously known from Yunnan only.

CAPRIFOLIACEAE

Abelia R. Brown

Abelia Graebneriana Rehd. in Sargent, Pl. Wils. 1: 118. 1911.

KWEICHOW: Hsu-feng, She-Won-Shan, *S. W. Teng* 90483, July 2, 1936, a shrub 5 ft. high, in light woods, bark pale gray, branches red, flowers pink. Western Hupeh and western Szechuan; new to Kweichow.

Weigela Thunberg

Weigela japonica Thunb. var. *sinica* (Rehd.) Bailey, Gentes Herb. 2: 49. 1929.

Diervilla japonica DC. var. *sinica* Rehd. Mitt. Deutsch. Dendr. Ges. 12: 264. 1913.

KWANGSI: Tzu-yuen District, *Z. S. Chung* 83603, Aug. 7, 1939, a shrub in woods, flowers young, pale green. KWEICHOW: Hsu-feng, She-Won-Shan, *S. W. Teng* 90477, July 1, 1936, a shrub 6 ft. high, by side of stream, fruit green. Anhwei, Chekiang, Hupeh, Szechuan.

ARNOLD ARBORETUM,

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A REVISION OF DISTYLIUM AND SYCOPSIS (HAMAMELIDACEAE)¹

EGBERT H. WALKER

With four text-figures

THIS revision has been undertaken because of the difficulty encountered in determining herbarium material and in integrating the scattered references to *Distylium* and *Sycopsis*. Judging from the number of references to unpublished names, especially in recent literature, there seems to be considerable work which is unpublished because of the war or suspended because of the confusion encountered in these genera. Although this revision clarifies much of our understanding of the genera, it must be considered as somewhat tentative, because several species are still represented by very inadequate collections and because several important specimens have not been available for study, being deposited in places of safety due to the war. Furthermore, no specimens could be borrowed from Europe, where most of the actual types are deposited.

The author has had the privilege of examining material from the following herbaria: Arnold Arboretum of Harvard University (A), Chicago Museum of Natural History, formerly Field Museum of Natural History (F), Gray Herbarium of Harvard University (G), University of Michigan Herbarium (Mi), Missouri Botanical Garden (Mo), New York Botanical Garden (Y), and United States National Museum (W).

In addition the writer wishes to acknowledge the great benefits of three projects undertaken in recent years aimed to assist botanical work such as this. The first is the insertion of botanical literature in herbaria along with the specimens, a project fostered and developed largely by Dr. E. D. Merrill, now Director of the Arnold Arboretum of Harvard University. By means of literature clipped or typed and attached to herbarium sheets or covers, many references were thus made immediately available. In some cases important published items were found which would not have been located by the usual means. This clipped literature was made available by loan along with the specimens.

Another project of major importance was the interpretation of H. L  veill  's woody plants by Prof. Alfred Rehder of the Arnold Arboretum, based on his study of L  veill  's collections in Edinburgh and the photographs and fragments which have been deposited at the Arnold Arboretum,² the results published from 1929 to 1931 in the Journal of the Arnold Arboretum. Without Professor Rehder's work our lists of "species insufficiently

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²For index to published results of these studies see Jour. Arnold Arb. 18: 278-321. 1937.

known" in taxonomic treatments would be embarrassingly long. There remains, however, much yet to be done in interpreting Lévillé's herbaceous species.

A third project was the photographing by Mr. R. C. Ching—under grant from the Rockefeller Foundation to the Fan Memorial Institute of Biology, Peking—of types and other important specimens in European herbaria. Only a partial set of these photographs is to be found in American herbaria, mostly at the New York Botanical Garden. The many references in this treatment to photographs of types in the Kew herbarium attest the value of this project. With the probable loss of much basic herbarium material in European institutions, the value of this work will become even greater.

Besides these three there are various other basic undertakings which might be mentioned as contributing greatly to this and other taxonomic interpretations of the eastern Asiatic flora. Research on Asiatic botany seems to be declining in Europe but increasing in America. It would wane here too if our great collections, all too poorly housed in these days of danger, should be injured, as is not impossible.

The genera *Distylium* Sieb. & Zucc. (occurring in Java, India, E. Asia, and Central America), *Sycopsis* Oliver (occurring in India and China), and *Sinowilsonia* Hemsl. (in Hook. Ic. Pl. 29: *pl.* 2817. 1907, occurring in China) constitute the tribe Distylieae Hallier f. of the subfamily Hamamelidoideae Reinsch., according to H. Harms (in Engler & Prantl, Nat. Pfl. ed. 2. 18a: 331–335. 1930). This tribe was characterized by H. Hallier as follows:

Leaves leathery, entire or toothed, evergreen with small lanceolate stipules, spicular cells, two-layered palisade tissue and small solitary crystals; inflorescences glomerate or racemose, axillary, solitary, peduncled; bracts small; flowers monoecious or andromonoecious, apetalous, the stamens with oblong anthers gradually narrowed downward into a short filament and upward into a point, dehiscing by two simple lateral longitudinal clefts. (Translated from the German in Beih. Bot. Centralbl. 14: 255. 1903.)

Sinowilsonia differs from this characterization in having thinner closely toothed and probably deciduous leaves and terminal inflorescences. Its flowers resemble closely in structure those of *Sycopsis* but have a longer receptacle tube and apparently a semi-inferior ovary. Although *Sinowilsonia* has no petals, it may better be placed with *Corylopsis* and *Fortunaria* in the tribe Corylopsideae, as A. Rehder has implied (in Sarg. Pl. Wils. 1: 428. 1913) and as H. K. Airy-Shaw has stated (in Curtis's Bot. Mag. 160: *pl.* 9501. 1937). The most recently described genus of Hamamelidaceae, *Matudaea* Lundell (in Lloydia 3: 209. 1940), from Mexico, conforms with Hallier's characterization of the Distylieae in most respects. It is near *Distylium* and was described as having only perfect flowers, these with 20 to 24 stamens. Its trinerved leaf bases are very distinctive.

The genus *Distylium* was first described in 1835 from Japan and remained an Old World genus distributed westward to India and south to

Java until 1933, when Radlkofer's description of the first New World species, *D. guatemalense*, from Central America, was published. In the present paper is described a second New World species, *D. hondurensis* Standl. This interesting distribution on both sides of the Pacific Ocean is paralleled in various other genera, especially of Celastraceae, as has been discussed by T. Loesener (in Bot. Jahrb. 24: 197-201. 1897). The genus has been introduced into cultivation and thrives in warm temperate and subtropical climates in both Europe and the United States, the type species, *D. racemosum*, being rather frequently mentioned in the literature on cultivated woody plants. It flowers in the early spring, its numerous red anthers adding color to the landscape.

In several, if not all, of the species of *Distylium* there is a marked tendency toward variability in both vegetative and reproductive parts, reaching in some species almost to polymorphism. This variability has led to the proposing of a number of new species which have been reduced to synonymy as more material has been found to link extreme forms. It furthermore makes the describing of new species based on only a few specimens a very unsatisfactory proceeding. The great variability in the flowers on the same plant has already been discussed by W. B. Hemsley (in Hook. Ic. Pl. 29: pl. 2835. 1907).

A review of some of the principal characters used in describing and differentiating species may lead to a better understanding of specific limits. The species of both *Distylium* and *Sycopsis* are either trees or shrubs. *Distylium racemosum* in cultivation seems always to be a shrub, but in its natural habitat it is almost always a tree. *Distylium buxifolium* (in the literature as *D. chinense*) is apparently always a shrub, but some species of these genera seem to be either large shrubs or small trees. The indument consists of lepidote scales, usually fimbriate, or of stellate hairs, the latter obviously derived from the former. Their character and presence or absence is fairly definite and is of some value in differentiating species. Leaf size, shape, and serration are very variable and difficult to use in most cases, but the lack of diagnostic characters in the flowering and fruiting parts makes it necessary to use these variable leaf characters in keys. The marginal teeth, when present, are always rather remote and confined to the upper half of the leaf. They may or may not, however, be present in the same species. Leaf venation likewise is fairly uniform, being always pinnate with about 6 lateral nerves, curved-anastomosing fairly far from the margins, except in serrate leaves, where the nerves usually end in the teeth. There is considerable variation among species in the prominence of the lateral nerves on the under sides of the leaves.

The variations in the floral parts between one species and another are so little or so inconsistently variable that they are of scant use in differentiating species. The inflorescences at anthesis are usually short, but lengthen as the fruits mature, as do also the pedicels. It is often difficult to determine whether flowers are unisexual or bisexual, because there may be found stamens and pistils of all degrees of development even in the same inflo-

rescence. Fruit characters are likewise unreliable for species differentiation, at least in our present state of knowledge, because the scarcity of material representing some species prevents our knowing the range of variation.

The genus *Sycopsis* was first described in 1860 from Assam, India, and is so far as now known confined to the Old World, ranging across China, through the Philippines, and south to New Guinea. It differs principally from *Distylium* in the elongated receptacle, which forms a tube completely covering the ovary and growing with the developing ovary or splitting irregularly and forming a cup around the base of the fruit. In its indument and leaf form and venation it closely resembles *Distylium*, except in the characteristic densely setose-pilose ovaries and fruits. The species of *Sycopsis* are much more distinct from one another than are those of *Distylium* and there is more consistent variation in the inflorescences, so much so in fact that the characteristics of these parts can be satisfactorily used in keys.

Both *Distylium* and *Sycopsis* are frequent hosts for gall-forming insects. Galls, often very large, appear on the leaf blades or petioles, and sometimes the inflorescences seem to be transformed. One often finds small tufts of hairs surrounding small domatia in the axils of the lateral nerves and midribs on the lower surface of the leaves.

KEY TO GENERA

- Ovary exposed, lepidote or stellate-pubescent, never densely setose-pilose; sepals and stamens hypogynous on margin of unexpanded receptacle; stamens 6 or less.....*Distylium*.
 Ovary free, enclosed in an expanded globose to urceolate receptacle tube, densely setose-pilose; sepals and stamens perigynous on upper edge of receptacle surrounding the style bases; stamens 10 or less.....*Sycopsis*.

DISTYLIUM

Distylium Sieb. & Zucc. Fl. Japon. 1: 178. pl. 94. 1835. — Based on the single species *D. racemosum* Sieb. & Zucc. from Japan.

Flowers unisexual and monoecious or andromonoecious in separate or the same axillary, erect, spicate or racemose, rarely branched inflorescences, bracteate, the bracts scarcely distinguishable from sepals. Sepals 0–6, small, bractlike, variable, below the ovary. Petals none. Staminate flowers in short spikes or glomerules, the pistils wanting or more or less developed, the stamens 1–6, the filaments rather slender, of varying lengths, the anthers ellipsoid, dehiscing by widely spreading longitudinal slits, the connective more or less protruding, apiculate. Pistillate or perfect flowers with superior, usually lepidote or stellate-hairy, bicarpellary ovary, each carpel 1-celled, 1-ovuled, the styles free, elongate, diverging, slender, more or less hairy, the stigmas apiculate. Fruits ovoid or subglobose, woody, stellate-lepidote or pilose capsules, splitting into 2 or 4 apiculate valves, the first rupture being through the style bases and perpendicular to the common partition between the two cells, the second between the styles and parallel to the partition, the elongate seeds thus escaping, the carpellary walls separating into two layers, the inner (endocarp) horny or woody, thicker than the outer. Leaves simple, alternate, coriaceous, evergreen,

ovate to lanceolate, entire or with a few teeth above the middle, pinninerved, the lateral nerves always curved-anastomosing.

Spring-flowering evergreen trees or shrubs, usually in woods or forests or along stream banks (*D. buxifolium* especially), in subtropical and warm temperate eastern and southeastern Asia (Japan to Assam and southern China, also Java) and Central America (Guatemala and Honduras).

Because of the great variability, especially in the floral parts, and the lack of material representing several species, the details of flowers and fruits in the following specific descriptions should be accepted with caution.

KEY TO NEW WORLD SPECIES

- Leaves glabrous beneath, not peltate.....1. *D. guatemalense*.
Leaves distinctly stellate-pubescent beneath, peltate.....2. *D. hondurensis*.

KEY TO OLD WORLD SPECIES³

Leaf blades 5 cm. long or less; Formosa, Bonin Islands, China.

Leaves rather broadly elliptic-ovate, very rarely toothed; trees or shrubs; Formosa or Bonin Islands.

Apex of leaf obtuse to rounded; small trees; Formosa.....3. *D. gracile*.

Apex of leaves usually rounded; shrubs; Bonin Islands.....4. *D. lepidotum*.

Leaves lanceolate or oblanceolate to elliptic-ovate or obovate, frequently with a few teeth; shrubs; China.....5. *D. buxifolium*.

Leaf blades usually over 5 cm. long, or, if smaller, from Java only.

Leaves glabrous beneath, even when young.

Lateral nerves not raised beneath.....6. *D. racemosum*.

Lateral nerves fine but distinctly raised beneath.

Margins of leaves entire or toothed; China.....7. *D. myricoides*.

Margins of leaves entire; India.....8. *D. indicum*.

Leaves pubescent beneath.⁴

Leaf blades over 10 cm. long and 4 cm. wide.

Young branchlets minutely puberulent; Java.....9. *D. stellare*.

Young branchlets densely pubescent, not minutely so; China....10. *D. Tsiangii*.

Leaf blades under 10 cm. long.

Leaf tips long-acuminate.

Leaves entire.....11. *D. pingpienense*.

Leaves serrate.....11a. *D. pingpienense* var. *serratum*.

Leaf tips short-acuminate, acute, obtuse, or rounded.

Young branchlets minutely puberulent; Java.....9. *D. stellare*.

Young branchlets densely pubescent, not minutely so; China..12. *D. Chungii*.

1. *Distylium guatemalense* Radlk. ex Harms in Notizbl. Bot. Gart. Berlin 11: 716. 1933. — Type, *H. von Tuerckheim II. 1613*, from Guatemala, in the Munich herbarium.⁵

A tree with grayish bark, the branchlets slender, minutely puberulent when young, glabrescent. Leaves petiolate, the petioles 1 to 1.5 cm. long,

³This key is based wholly on vegetative characters and must be used with considerable caution. Floral and fruiting characters are entirely unreliable and even vegetative characters are very variable. For other keys see Guillaumin in Bull. Soc. Bot. France 61: 34. 1914; Harms (after Guillaumin) in Engler & Prantl, Nat. Pfl. ed. 2. 18a: 331-332. 1930; and C. P'ei in Contr. Biol. Lab. Sci. Soc. China Bot. Ser. 10: 122. 1936.

⁴The original description of *D. indicum* says the leaves are "more or less stellately pubescent" beneath, but available specimens and the only other description known (D. Brandis, Indian Trees. 301. 1906) indicate that they are glabrous.

⁵H. Harms published after Radlkofer's death the latter's incomplete description based on his Munich specimens, completing the description from the Berlin specimens.

stellate-puberulent, the lower part thicker than the upper, the blade ovate or elliptic- or oblong-ovate, acute or acuminate at apex, obtuse or broadly acute and asymmetric at base, 8 to 13 cm. long, 4 to 6.5 cm. wide, entire or somewhat wavy-margined, glabrous except on the prominent midrib beneath and near base above, the lateral nerves about 5 pairs, raised beneath, curved-anastomosing but not prominently so, connected by raised scalariform tertiary nerves. Flowers andromonoecious or perfect (so far as known), in dense pubescent spikes or racemes about 2 cm. long, the pedicels minute or wanting, the bracts few, small, lanceolate to ovate, caducous. Stamens 5 or 6, the anthers 1 to 1.5 mm. long, with a tuft of hairs at apex, the filaments glabrous, variable in length. Fruit unknown.

GUATEMALA: Alta Verapaz: *H. von Tuerckheim II. 1613* (A, W — originally in the John Donnell Smith herbarium), in a thicket of indigenous species in a pasture near the entrance to the city of Coban, in flower Jan. 1907.

This is the first described New World member of this genus. It appears to be much restricted in distribution. An additional collection (sterile) is reported by H. Harms from a forest on the Chiu River, Sept. 1912.

2. *Distylium hondurensense* Standl. apud Walker, sp. nov.

Arbor 6–9-metralis, ramulis gracilibus plus minusve flexuosis dense stellato-tomentosis, tomento ochraceo vel brunnescente; folia petiolata subchartacea, petiolo ca. 1.5 cm. longo stellato-tomentoso vel glabrato; lamina ovata vel oblongo-ovata 6.5–11 cm. longa 3–5.5 cm. lata, breviter vel longiuscule acuminata, basi vulgo plus minusve obliqua obtusa vel anguste rotundata et breviter (2–3 mm. supra basin) peltata, supra viridis primo sparse stellato-puberula, cito glabrata, subtus ubique dense stellato-tomentosa tactu mollis, costa elevata, nervis lateralibus utroque latere ca. 7 leviter arcuatis marginem attingentibus, non distincte anastomosantibus, marginibus fere integris vel remote obscure denticulatis, supra medio intermedium undulato-denticulatis; flores ignoti; capsula (tantum in statu aperto visa) ca. 13 mm. longa 4-valvata stellato-tomentosa lignosa. [Description by P. C. Standley]

DISTRIBUTION: Known only from Honduras.

HONDURAS: Comayagua: In a wet ravine near El Achote, in mountains above the plains of Siguatepeque, 1350 m. alt., *T. G. Yuncker, R. F. Dawson and H. R. Youse 6377* (F — TYPE), Aug. 1936; Tegucigalpa: In a pine and oak forest near the river, Montaña de la Flor, 960 m. alt., *Christine & Wolfgang von Hagen 1193* (F), Dec. 1937; local name Matón.

The second collection cited is sterile and was taken from what was probably a luxuriant branch. The leaf blades are as much as 18 cm. long and 11.5 cm. wide. This was first reported from Honduras as *D. guatemalense* Radlk. (Field Mus. Publ. Bot. 17: 364. 1938).

3. *Distylium gracile* Nakai in Jour. Arnold Arb. 5: 77. 1924. — Type, *E. H. Wilson 11107*, from Formosa, at the Arnold Arboretum.

"A small tree 10 m. high, trunk 60 cm. diam." (according to E. H. Wilson, collector), the branchlets slender, grayish brown, stellate-pubescent when young, glabrescent. Leaves with stellate-pubescent petioles 2 to 4 mm. long, the blade broadly elliptic-ovate to obovate, obtuse to broadly acuminate with callose tip, obtuse to acute at base, 2 to 3 cm. long, 0.7 to 2 cm. wide, entire or rarely with 1 or 2 teeth on each side above the middle,

glabrous, the lateral nerves 3 or 4 pairs, inconspicuous, only slightly raised. Flowers unknown. Capsules globose to ovoid, 1 cm. long, light brown, closely stellate-pubescent, 1 or 2 in racemose inflorescences up to 1 cm. long.

FORMOSA: Prov. Karenko: Cliff near Seisui, E. H. Wilson 11107 (A, W).

This is a very distinct species, recognized by its small, broadly ovate leaves.

4. *Distylium lepidotum* Nakai in Bot. Mag. Tokyo 32: 220. 1918, 44: 23. 1930. —

Types collected by H. Hattori on Anishima and Chickishima, Bonin Islands, probably in the Tokyo herbarium. Not seen.

A shrub 1.5 to 3 m. high or a tree to 10 m. with a trunk diameter of "3–4 feet" (according to E. H. Wilson's notes), the branchlets grayish, densely lepidote when young, glabrescent. Leaves with glabrous or lepidote petiole about 5 mm. long, the blade rather broadly elliptic-ovate, usually rounded or sometimes very broadly obtuse at apex, obtuse at base, 2 to 4 cm. long, 1.5 to 2.5 cm. wide, entire, glabrous, "rather glaucous" (according to E. H. Wilson), green above, greenish beneath (when dry), the midrib prominent beneath, the lateral nerves about 4 pairs, obscure, not raised beneath. Flowers in short stellate-lepidote spikes or racemes up to 2 cm. long, the bracts ovate, lepidote, the sepals lanceolate, glabrous or lepidote. Stamens apparently only up to 4 in number, the anthers large, apiculate,



FIG. 1. *Distylium buxifolium*, showing leaf variations, $\times \frac{1}{2}$: a. drawn from Dunn (Herb. Hongkong 2681) (A), from Fukien, isotype of *D. strictum* Hemsl.; b. drawn from E. H. Wilson 2961 (W), from Hupeh; c. drawn from Henry 3314 (W), from Hupeh.

the filaments variable in length. Capsules solitary or few, elliptic-ovoid, about 1.5 cm. long, densely lepidote when young.

BONIN ISLANDS: *Chickishima*: *E. H. Wilson* 8241 (A, W), 8347 (A, Mo, W); *Anishima*: *E. H. Wilson*, May 3, 1917; no precise locality: *C. Wright* 174 (U. S. North Pacific Exploring Expedition under commanders Ringgold and Rodgers, 1853) (G, W).

Although this species was first described in 1918, based on Japanese specimens, it was first collected in 1853 by the American botanist Charles Wright. In the distribution of the duplicates of this Wright collection confusion of labels resulted in some being referred to the Liu Chiu Islands. This confusion has been clarified by reference to Asa Gray's unpublished manuscript at the Gray Herbarium. Each of the Wright collections at the U. S. National Herbarium, the Gray Herbarium, and the Kew Herbarium has been designated by separate workers as the type of a new species, but none of these "herbarium names" have been published, so far as can now be ascertained.

5. *Distylium buxifolium* (Hance) Merr. in *Sunyatsenia* 3: 251. 1937. — Based on *Myrsine buxifolia* Hance. FIG. 1.

Myrsine buxifolia Hance in *Ann. Sci. Nat.* IV. Bot. 15: 225. 1861. — Type, *C. F. M. DeGrijs* (Herb. Hance 6687), from Fukien, in the British Museum herbarium (see Merrill in *Sunyatsenia* 3: 251. 1937). A rubbing has been examined.

Distylium racemosum var. *chinense* Franch. ex Hemsl. in *Jour. Linn. Soc. Bot.* 23: 290. 1887. — Based on a Delavay collection probably in the Paris herbarium.⁶

Distylium chinense (Franch.) Diels in *Bot. Jahrb.* 29: 290. 1900. — Based on *D. racemosum* var. *chinense* Franch.

Rapanea buxifolia (Hance) Mez in *Pflanzenr.* 9 (IV. 236): 362. 1902. — Based on *Myrsine buxifolia* Hance.

Distylium chinense Hemsl. in Hook. *Ic. Pl.* 29: *pl.* 2835. 1907. — Based on *D. racemosum* var. *chinense* Franch., although designated as "n. sp."

Distylium strictum Hemsl. in Hook. *Ic. Pl.* 29: sub *pl.* 2835 (p. 3). 1907. — Type, *S. T. Dunn* (Herb. Hongkong 2681), from Fukien, in the Kew herbarium. Duplicate examined.

Distylium Dunnianum H. Lév. in *Repert. Sp. Nov.* 11: 67. 1912. — Type, *Cavalerie* 3551, from Kweichow, in the Léveillé herbarium in Edinburgh. Duplicate examined.

Myrica Seguini H. Lév. in op. cit. 12: 537. 1913. — Type, *J. Cavalerie* 3929, from Kweichow, in the Léveillé herbarium in Edinburgh. Duplicate examined.

Myrica rapaneoides H. Lév. in *Bull. Acad. Int. Géogr. Bot.* 24: 146. 1914. — Type, *J. Cavalerie* 3929, from Kweichow, in the Léveillé herbarium in Edinburgh. Duplicate examined.

A densely branching shrub up to 2 m. high, the branchlets grayish brown, stellate-puberulent when young, glabrescent. Leaves with short, puberu-

⁶In the original publication the authority is given as "Franchet in litt." and the description is enclosed in quotation marks. The specimens cited are *A. Henry*, from Ichang, Hupeh, and *Delavay*, "rocks on the banks of the Blue river at Kouimen," Szechwan, both in the Kew herbarium. Collector's numbers were not cited, but a photograph by R. C. Ching distributed from the Fan Memorial Institute of Biology to the New York Botanical Garden of the Kew specimens shows them to be *Henry* 1300 (received at Kew in 1886) and *Delavay* 2290, collected March 20, 1882. As Franchet's description was in all probability based on the Delavay specimen in Paris, where his collections were being studied, *Delavay* 2290 in the Paris herbarium is presumably the type. Both the Henry and Delavay specimens have the toothed form of leaf.

lent petiole about 2 mm. long, the blade very variable in shape, from oblong or elliptic-lanceolate to ovate or obovate, acute to subrounded and sometimes acuminate with callose tip, acute at base, 2.5 to 5 cm. long, entire or with 1 to 3 callose teeth on each side above the middle (the shape then usually somewhat obovate), generally glabrous but sometimes stellate-puberulent beneath especially on the prominent midrib, the lateral nerves 4 or 5 pairs, not conspicuous, the veinlets sometimes distinctly reticulate. Flowers appearing conspicuously red, in subglobose to spicate stellate-pubescent inflorescences up to 2 cm. long in fruit, the bracts and sepals alike, ovate, glabrous or pubescent, about 3 mm. long. Stamens up to 6, often unequal, the anthers large, red, apiculate, the filaments variable, up to 3 mm. long. Capsules 1-8 in each inflorescence, ovoid, about 7 mm. long (reported up to 1.5 cm. long by Hemsley), more or less stellate-puberulent.

DISTRIBUTION: China. Occurs in sandy or rocky places along river banks which are subject to being flooded.

CHINA: Hupeh: Ichang, *Henry* 3314 (A, G, W, Y), 4280 (A, W), *Wilson* (Arnold Arb. Exp.) 3537 (A, W); no precise locality, *Henry* 3826 (A, G), 7805 (G), *Wilson* (Veitch Exp.) 115, *Wilson* (Arnold Arb. Exp.) 2691; Kweichow: Lofou, *J. Cavalerie* 3551 (A); no precise locality, *J. Cavalerie* 3929 (A); Gan Chouen, *J. Cavalerie* 4236 (A); Djiangdi, *Handel-Mazzetti* 10272 (A); Dyun (or Tyun), *Handel-Mazzetti* 10692 (A); Gudschou, *Handel-Mazzetti* 10810 (A); Tehkiang, Tsaoti, *Steward*, *Chiao & Cheo* 898 (A); Lungli, *Y. Tsiang* 8404 (Y); Chekiang: Sui Chang Hsien, *H. H. Hu* 493 (A); Tsingtien, *Y. L. Keng* 123 (A); no precise locality, *Barchet* 170 (W), *S. Chen* 3230 (A), 3431 (A); Fukien: No precise locality, *S. T. Dunn* (Herb. Hongkong 2680, 2681) (A).

This species is usually referred to as *D. chinense* Franch. The fairly abundant material assembled for this study shows that the range of variation is very great in this species. Hemsley described *D. chinense* and *D. strictum* at the same time, selecting *Wilson* (Veitch Expedition) 115, a partly toothed wide-leaved specimen, as typical of the former, and *Dunn* 2681, an entire and unusually narrow-leaved form as compared with other material from Fukien, as representative of the latter. By study of intermediates these now appear to represent one species, the oldest name, however, unfortunately not being that in common use. The great variability in flowers has been pointed out by H. K. Airy-Shaw (in Curtis's Bot. Mag. 160: pl. 9501. 1937). The variation in leaf shape is very striking. This is apparently the most common species in China.

6. *Distylium racemosum* Sieb. & Zucc. Fl. Japon. 1: 179. pl. 94. 1835. — Originally described, without mention of specimens, from Kiushiu, Japan.

Usually a large tree, up to 25 m. high, the branchlets densely stellate-lepidote when young, glabrescent. Leaves with glabrous or lepidote petiole 3 to 8 mm. long, the blade elliptic-ovate or rarely slightly obovate, generally obtuse or sometimes acute or often broadly obtuse to subrounded at apex, acute or obtuse at base, 5 to 7 cm. long, 2 to 3 cm. wide, rarely up to 8.5 cm. long and 4 cm. wide, entire (for possible exception see discussion), glabrous, the midrib prominent beneath, the lateral nerves about 6 pairs, obscure on both surfaces. Flowers appearing red, in usually densely stellate-lepidote spikes or racemes up to 4 cm. long in fruit, the bracts ovate or oblong, stellate-pubescent or lepidote, about 4 mm. long, the sepals variable, lanceolate or ovate, about 3 mm. long, stellate-lepidote. Stamens up to 6,

the anthers bright crimson, up to 4 mm. long, apiculate, the filaments variable, up to 3 mm. long, rather slender. Capsules ovoid with apiculate valves, about 1 cm. long, brown to tan-colored, densely stellate-lepidote or puberulent.

DISTRIBUTION: Eastern Asia. In forests, often on mountains.

KOREA: Saishu To (Quelpaert Isl.): *U. Faurie* 549, 550, 1612, 1613 (A) (all 1906 or 1907), *E. J. Taquet* 819, 820, 821, 4252, 4253, 4254, 4255 (A) (Jan.-July 1910), *E. H. Wilson* 9515 (A, W). JAPAN: Tsushima Strait: *U. Faurie* 4831 (A); Kyushu: Nagasaki, *C. J. Maximowicz*, Iter secunda, 1863 (G, W, Y), *R. Oldham* 466 (G, Y); Higashi-kirishima, *E. H. Wilson* 6222 (A); Satsuma, *H. Mayr*, Feb. 28, 1886 (A); no precise locality, *E. H. Wilson* 6039 (A, Mo, W); Honshu: Cultivated at Yokohama: *E. H. Wilson* 6414 (A); no precise locality: *Buerger* (ex Herb. Lugd.-Bat.) (G). LIU KIU ISLANDS: Okinawa-shima: Kunigami-ken, *R. Kanehira* 3283, 3326 (Y); near Nago, *E. H. Wilson* 8070 (A, W); Amami Oshima: *R. Kanehira* 3406 (Y). FORMOSA: South Cape, *A. Henry* 980 (A). CHINA: Chekiang: *C. Y. Chiao* (Herb. Univ. Nanking 14642) (A, W); Kwangtung: Hongkong, *C. Ford* (G, Y), *C. Wilford* (G, Y), *C. Wright* 183 (U. S. North Pacific Exploring Expedition under commanders Ringgold and Rodgers) (G, W).

This is the most widely cultivated species of *Distylium* or *Sycopsis*. In cultivation it appears usually to be a shrub, but in its native habitat it is described as a tree. Cultivated plants seem to bear larger leaves and inflorescences. The most comprehensive treatment of this species is that by H. K. Airy-Shaw in Curtis's Bot. Mag. 160: pl. 9501. 1937. Two variants, apparently only horticultural forms, have been recognized, var. *variegatum*, attributed by H. Harms to Siebold,⁷ and var. *pendulum* Makino, in Jour. Jap. Bot. 6: 4. 1929, based on a collection by Makino in 1928. The leaves of all the Hongkong specimens are green above and distinctly brown beneath, a character which appears also in *D. indicum* and occasionally elsewhere but which can not now be interpreted. R. Kanehira's collections from the Liu Kiu Islands, nos. 3283 with mature fruit, 3326 with immature fruit, and 3406 sterile, all in the New York Botanical Garden, have been designated as representing a new species, but the name seems not to have been published. These specimens vary considerably in leaf size and shape, especially no. 3283 with distinctly smaller leaves, but all readily conform to the characters of *D. racemosum* as here given. Some of the leaves of no. 3406 have a few remote teeth above the middle, a character common in *D. buxifolium* of China, but not found elsewhere in *D. racemosum*. Recognition of a new species on the basis of these variations does not seem justifiable.

7. *Distylium myricoides* Hemsl. in Hook. Ic. Pl. 29: sub pl. 2835 (p. 2). 1907. — Type, S. T. Dunn (Herb. Hongkong 2684), in the Kew herbarium. Duplicate examined.

A large shrub 3 m. high to a large tree up to 20 m. high with a trunk diameter of 45 cm., the branchlets grayish or brownish, somewhat lepidote when very young. Leaves with lepidote petiole 5 to 10 mm. long, the blade elliptic-ovate to obovate, acute and sometimes acuminate at apex, acute at base, 5 to 10 cm. long, 2 to 4 cm. wide, entire or with 1 to 3 obscure or definitely callose serrate teeth near the acuminate tip (the blades then

⁷Mitt. Deutsch. Dendr. Ges. 44: 5. 1932. The only other reference found is a description in W. J. Bean, Trees & Shrubs Brit. Isl. 1: 501. 1914.

generally obovate), glabrous, rather shining green above, paler beneath (when fresh), the midrib impressed above, prominent beneath, the lateral nerves about 5 pairs, rather fine but raised beneath. Flowers in short lepidote spikes or racemes up to 2 cm. long in fruit, the bracts and sepals variable, about 3 mm. long, caducous. Stamens few, the anthers rather large, apiculate. Capsules solitary or few in a raceme, elliptic-ovoid, 1 cm. long, gray to grayish green, not ferruginous, densely stellate-lepidote to puberulent.

DISTRIBUTION: Eastern and southeastern China. In dense or open woods or in thickets along streams, in ravines, or on slopes.

CHINA: Anhwei: Hwangshan, *R. C. Ching* 3026 (A); Tien Chu Shan, Chien Shan Hsien, *C. S. Fan & Y. Y. Li* 128 (A); Kiangsi: Lushan, *H. H. Chung & S. C. Sun* 634 (A, Y); Chekiang: South of Ping Yung, *R. C. Ching* 2081 (A, W, Y); Tai Pai Shan, *Y. L. Keng* 1147 (A); western Chekiang, *R. C. Ching* 3293 (A, Y—photo); Fukien: Buong Kang, Yenping, *H. H. Chung* 3328 (A); Kushan, *H. H. Chung* 8503 (A); no precise locality, *H. H. Chung* 7855 (A); *S. T. Dunn* (Herb. Hongkong 2684) (A); Kwangtung: Fan Shui Shan, Wung Yuen Dist., *S. K. Lau* 2568; Yang Kue Ho, Yao Shan, Lochang Dist., *C. L. Tso* 20869 (A, Y).

This species resembles most closely *D. buxifolium*, from which it may be distinguished by its larger leaves.

8. *Distylium indicum* Benth. ex C. B. Clarke in Hook. f. *Fl. Brit. Ind.* 2: 427. 1878.—Type, *Griffith* 3377, from Khasi Hills, Assam, India, in the Kew herbarium. Duplicate examined.

A small tree, the branchlets ferruginous-stellate-pubescent when young, glabrescent. Leaves with margined petiole less than 1 cm. long, the blade obovate or elliptic, rounded or gradually or abruptly acuminate at apex, cuneate at base, 7 to 10 cm. long, entire, glabrous or pubescent (see footnote 4, in key to species, above), green above, distinctly brown beneath when dry, the lateral nerves about 6 pairs, rather prominently raised beneath, the lower pair subbasal or more acutely diverging than the others. Flowers in spikes or racemes up to 6 cm. long (from descriptions), the bracts and sepals caducous, the remainder unknown. Mature fruit unknown, the immature fruit about 1.3 cm. long, densely stellate-pubescent.

INDIA: Assam: Khasi Hills, *Griffith* 3377 (G).

So far as known, the only specimen cited in any treatment of this species is *Griffith* 3377.⁸ The original description makes no mention of the habit, but the most recent treatment describes it as a small tree. The above description is based in part on these earlier publications. The species is apparently rare. Airy-Shaw (in Curtis's Bot. Mag. 160: *pl.* 9501. 1937) has suggested that *D. indicum* Benth. and *D. myricoides* Hemsl. from China may be the same, but in view of the scarcity of material from India, it seems inadvisable to combine them at this time. Comparison of available material shows the Indian species to have somewhat larger leaves with the lateral nerves more prominent beneath. The brown lower leaf surfaces of *D. indicum* resemble those in the Hongkong specimens of *D. racemosum*.

⁸D. Brandis, *Indian Trees*. 301. 1906, and U. N. and P. C. Kanjilal and A. Das, *Flora of Assam* 2: 236. 1938, are the only known references, besides the original description. In the *Flora of Assam* this specimen is erroneously referred to as 3397. A photograph at the New York Botanical Garden of the type at Kew has been examined.

9. *Distylium stellare* O. Kuntze, Rev. Gen. Pl. 1: 233. 1891. — Originally described from Java without mention of specimens, but the type identified through subsequent treatments⁹ as *O. Kuntze 5751*, in the New York Botanical Garden. Examined.

A tall tree up to 13 m. high, the branchlets grayish to brownish, lenticellate, stellate-pubescent when young, glabrescent. Leaves with stellate-pubescent petiole up to 1 cm. long, the blade ovate to elliptic- or oblong-ovate, sometimes slightly obovate, obtuse or acute and more or less acuminate at apex, acute to obtuse at base, 4 to 8 cm. long, 2.5 to 4 cm. wide (3 to 17 cm. long, 1.5 to 6.5 cm. wide, according to J. J. Smith), entire,¹⁰ glabrous and shining above, stellate-lepidote or puberulent beneath when young, glabrescent, the midrib slightly impressed above, raised beneath, the lateral nerves 5 or 6 pairs, raised beneath. Flowers in spikes, the staminate inflorescences 0.4 to 0.5 cm. long, the pistillate 0.8 to 1.9 cm. long (according to J. J. Smith), the fruiting up to 2 cm. long, bearing 1 to 4 fruits, the bracts ovate-oblong, about 3 mm. long, the sepals lanceolate, about 2 mm. long, stellate-pubescent. Stamens 3 to 5 (according to J. J. Smith), the anthers cordate-ovate, obtuse, about 2 mm. long, the filaments rather long. Capsules apparently sessile, ovoid to subglobose, 1 to 1.5 cm. long, little split parallel to wall between cells of ovary, the valves apiculate, the surface densely rather dark stellate-pubescent.

DISTRIBUTION: Java, alt. 1000 to about 2500 m., Sumatra? (see Backer in Brittonia 3: 79. 1938), and Malay Peninsula.

JAVA: Preanger, *Koorders 1807* β (A); *C. G. G. J. van Steenis 12231* (A); Preanger, Mt. Patoeha, *C. G. G. J. van Steenis* (Herb. Hort. Bot. Bog. 6984) (A); Besoeki, *C. G. G. J. van Steenis 10817* (A); Kedoe, *Koorders 27640* β (A); Dienggebirge, *Kuntze 5751* (Y); Wonosobo, *C. Java, Netherlands Indies Forest Service* (Herb. Hort. Bot. Bog. 2555) (A); Bandoeng, *Tjipadaroeöm, W. Java, Netherlands Indies Forest Service* (Herb. Hort. Bot. Bog. 3977) (A). MALAY PENINSULA: Pahang: Cameron's Highlands, about 1600 m. alt., *M. R. Henderson* (Singapore Field no. 23567) (A).

10. *Distylium Tsiangii* Chun in herb., ex Walker, sp. nov. FIG. 2.

Arbor 7 m. alta, ramulis junioribus valde stellato-pubescentibus glabrescentibus. Foliorum petiolus dense stellato-pubescentibus 1–1.5 cm. longus; lamina elliptico- vel oblongo-lanceolata ad ovata, apice acuta vel acuminate, basi late acuta, 11–15 cm. longa, 4–5 cm. lata, integra vel apicem versus paucidentata, supra nitida viridis, subtus pallidior ("deep lustrous green above, light green below" — ex Y. Tsiang) et valde stellato-pubescentibus, praesertim in costa et nervis lateralibus, his circa 7-jugis, supra impressis subtus valde elevatis, capillis aliquis fere atris, nervulis elevato-reticulatis. Flores ignoti. Inflorescentiae fructiferae racemosae valde pubescentes ad 3 cm. longae, capsulis ovoideis circa 1.2 cm. longis, valde stellato-pubescentibus, cinereis ("light gray" — ex Y. Tsiang). [Description by Walker]

CHINA: Kweichow: Waichai, Tuhshan, near the Kwangsi border, in a densely wooded ravine, *Y. Tsiang 6692*, Aug. 25, 1930 (A — TYPE, W, Y).

⁹An important subsequent description is by J. J. Smith in Meded. Dept. Landb. [Nederl.-India] 18: 81. 1914 (S. H. Koorders & T. Valetton, Bijdr. Boomsorten Java 13: 80. 1914). Further references occur in or may be found through the following: Versl. Med. Akad. (Amsterdam) 18¹: 359–361. 1909; H. Hallier in Meded. Rijks Herb. Leiden 37: 15. 1918; C. A. Backer in Brittonia 3: 79. 1938.

¹⁰J. J. Smith describes the leaves on young trees as laxly dentate, and O. Kuntze says "ad apicem versus repando paucidentata."

Y. Tsiang's nos. 7019 and 6692 were distributed as "*Distylium Tsiangii* Chun sp. nov." In 1932 W. C. Cheng (in Contr. Biol. Lab. Sci. Soc. China 8: 142) referred the first of these numbers to *D. Chungii* (Metc.) Cheng, when transferring that species from *Sycopsis*, and mentioned in his notes that Prof. Chun had named it "*D. Tsiangii*" but that the name had not been published. As I have found no subsequent publication of this species, but believe that it may have appeared in print and not become available in this country because of the war, it seems advisable to use Chun's name.



FIG. 2. *Distylium Tsiangii*, drawn from the type, $\times \frac{1}{2}$.

Using this name will thus minimize the adjustment, if it should subsequently appear that this name has already been published. It would be preferable to choose as the type the same collection selected by Chun, no. 7019, of which a duplicate is at the New York Botanical Garden. However, that specimen is in safe storage for the duration of the war and only *Tsiang* 6692 is available for study.

11. *Distylium pingpienense* (Hu) Walker, comb. nov. FIG. 3, a.

Sycopsis pingpienensis Hu in Bull. Fan Mem. Inst. Biol. Bot. 10: 149. 1940. — Type, H. T. Tsai 62201, from Yunnan, at the Fan Memorial Institute of Biology, Peking. Duplicate examined.

A shrub 3 m. high, the branchlets very slender, stellate-pubescent when young, glabrescent. Leaves with densely stellate-pubescent or hirsute petiole about 8 mm. long, the blades ovate to elliptic-ovate or lanceolate, long-acuminate at apex, obtuse to subrounded and more or less asymmetric at base, entire, glabrous and shining above, glabrous or stellate-pubescent beneath especially on the prominently raised midrib and the 5 to 8 raised lateral nerves, these inconspicuous and slightly impressed above. Flowers unknown. Fruiting inflorescences racemose, up to 2 cm. long, the capsules immature, ovoid, densely pubescent with yellowish-brown stellate hairs.

CHINA: Yunnan: Pingpien Hsien, *H. T. Tsai* 62201 (A).

11a. *Distylium pingpienense* var. *serratum* Walker, var. nov. FIG. 3, b.

E forma typica foliis serratis, dentibus utrinque 1-4 tenuiter apiculatis supra medio nonnihil remotis, nervis lateralibus curvato-anastomosantibus vel in dentibus terminantibus, capsulis atro-fuscis differt.

CHINA: Hupeh: Patung Hsien, *Ho-ch'eng Chow* 706 (A — TYPE, Y).

This variety is proposed in order to focus attention on the distinctive serration with apiculate teeth, in the hope that collectors will obtain more material by which the true value of this character may be determined. In



FIG. 3. *Distylium pingpienense*, $\times \frac{1}{2}$: a. drawn from an isotype of the species (A); b. var. *serratum*, drawn from the type.

related species of which abundant material is available, leaf serration is merely a variation without recognizable taxonomic significance. The great distance between the type localities of the species and its variety should also be considered. The difference in pubescence of fruits may prove to be inconstant.

12. *Distylium Chungii* (Metc.) Cheng in Contr. Biol. Lab. Sci. Soc. China Bot. Ser. 8: 140. 1932. — Based on *Sycopsis Chungii* Metc.

Sycopsis Chungii Metc. in Lingnan Sci. Jour. 10: 414. pl. 59. 1931. — Type, *H. H. Chung 2095*, from Pehling Inn, Fukien, in the Amoy University herbarium. Duplicate examined.

A forest tree up to 20 m. high, the branches grayish, densely stellate-pubescent when young, glabrescent. Leaves with densely stellate-pubescent petiole 1 cm. long, the blade elliptic- to oblong-ovate, subrounded to obtuse with acuminate or merely callose apiculate tip, obtuse to rounded at base, 5 to 9 cm. long, 2.5 to 4 cm. wide, entire or with 1 to 3 obscure callose teeth on each side above the middle, shining and glabrous above except on the impressed midrib, stellate-pubescent beneath especially on the prominent midrib, the lateral nerves 5 or 6 pairs, usually impressed above, raised beneath. Flowers unknown but reported to be "red" (according to H. H. Chung). Fruiting inflorescences racemose, scarcely 2 cm. long, densely stellate-lepidote or puberulent, the capsules ovoid, about 1.2 cm. long, densely stellate-lepidote or puberulent.

CHINA: Fukien: Pehling, Minhow Hsien, *H. H. Chung 2095* (A — isotype); Foochow, *H. H. Chung 8190* (A, Y); Kuliang, *F. P. Metcalf & T. C. Chang 248* (A), *J. B. Norton 1568* (W); Hinghwa Hsien, *H. H. Chung* (Herb. Amoy Univ. 1012) (A).

An excellent drawing of this species is given in H. H. Hu and W. Y. Chun, Ic. Pl. Sin. 3: 43. pl. 143. 1933, but with the name "*Sycopsis Chingii* Metc.," which is apparently a typographical error.

SPECIES INSUFFICIENTLY KNOWN

1. *Distylium formosanum* Kanehira, Anat. Char. & Ident. Formos. Woods. 106. 1921, Formos. Trees ed. 2. 253. 1936.

The original description of this species dealt almost entirely with anatomical structures of the wood and cited a wood specimen only. The morphological characters were described in 1936 with reference to the original anatomical description but without mention of herbarium specimens. Thus the wood specimen must stand as the technical type. Kanehira's description of the wood anatomy of this new species from Formosa has been compared with his description of the wood anatomy of *D. racemosum* Sieb. & Zucc. in Japan. Mr. W. N. Watkins of the Section of Wood Technology, U. S. National Museum, has examined a specimen in the Museum's collection of wood samples originally received from Yale University as *D. racemosum* Sieb. & Zucc. and labeled as "authenticated" (without further explanation of the meaning of this term). We are strongly inclined to the belief that *D. racemosum* and *D. formosanum* can not be differentiated on the basis of wood anatomy alone. H. K. Airy-Shaw (in Curtis's Bot. Mag. 160: pl. 9501. 1937) suspected that Kanehira's 1936 description was inaccurate, because of the comparison of *D. formosanum*, an endemic tree,

with *D. chinense* (Franch.) Diels, a shrub of the mainland, rather than with *D. racemosum* Sieb. & Zucc., a tree occurring in Japan, southern Formosa, and Hongkong. Comparison of Kanehira's description of *D. formosanum* with the characters here given for *D. racemosum* shows significant leaf differences as follows:

D. formosanum: Leaves oblong, acuminate, stellate-lepidote, 10 cm. long, the upper part obscurely crenate.

D. racemosum: Leaves ovate, obtuse or acute, glabrous, 5 to 8.5 cm. long, entire except one uncertain specimen from the Liu Kiu Islands with smaller leaves.

The original publication states that this is a tree of primary forests at medium altitudes, abundant in Sintiku and Arisan. Until significant material from Formosa has been examined, this species must remain in doubt.

2. *Distylium velutinum* Hu in Bull. Fan. Mem. Inst. Biol. Bot. 10: 148. 1940. — Type, *H. T. Tsai 62636*, from Tsing Pien Hsien, Yunnan, China, collected July 14, 1934; *T. T. Yü 3659* and *3205* from La Po Hsien, southwestern Szechwan, are also cited.

None of the originally cited specimens and little material of this genus from Yunnan and Szechwan have been available for this study. This shrub, about 3 meters high, seems, according to the original description, to be especially distinct in the stellate-velutinous and stellate-lepidote under surfaces of the leaves, these also bearing coarser black stellate hairs on the veinlets. They are also described as 3-veined at the base and sometimes remotely setose-denticulate along the margins. It is compared with "*D. Chingii* Chun," which differs in having larger leaves, but I am unable to find any publication of this name. Concerning the fruits Hu says: "exocarpium lepidotum, endocarpium superne ad stylum persistentem, dense longe albo-villosum." In no other species of *Distylium* has any indument been noted on the endocarp. It is possible that the enlarged receptacle tube of a species of *Sycopsis* has been mistaken for the exocarp, and that the enclosed fruit, which is always pilose or villose in *Sycopsis*, has been mistaken for the "endocarpium." But until representative material can be examined this species must remain in doubt.

3. *Distylium lanceolatum* Chun ex W. C. Cheng in Contr. Biol. Lab. Sci. Soc. China Bot. Ser. 10: 124. 1936. Based on *R. C. Ching 5512*, from Kwangsi.

In his discussion of *D. strictum* Hemsl. (now *D. buxifolium* (Hance) Merr.), W. C. Cheng inadvertently effected publication of Chun's name, which until then was apparently unpublished. His remarks are as follows: "The closely related species, *D. lanceolatum* Chun (*R. C. Ching* no. 5512 from Kwangsi), which differs from the present species by its lanceolate leaves dull brown on the lower surface when dry, not callose-apiculate at apex, and by its somewhat obovate capsules with light brown stellate hairs, is probably not yet published." Although there is a specimen of *Ching 5512* in the New York Botanical Garden, distributed under this name and designated as "cotype," it is unfortunately in safe storage for the duration of the war and is not available for this study. The brown lower surface of the leaves is apparently another occurrence of this as yet uninterpreted

character mentioned in the discussion of *D. indicum* Benth. and *D. racemosum* Sieb. & Zucc.

EXCLUDED SPECIES

In 1937 H. K. Airy-Shaw mentioned in his treatment of *Distylium racemosum* Sieb. & Zucc. (Curtis's Bot. Mag. 160: pl. 9501. 1937) the existence of an unidentified New World species of this genus in the G. B. Hinton collections from Mexico. His associate, N. Y. Sandwith, has kindly reported that the Hinton collections are nos. 3090 (fls.) and 6163 (frts.). Duplicates of these in the U. S. National Herbarium have been compared with the type of *Matudava trinervia* Lundell, *E. Matuda* S-194 (Mi) and found to be the same. This New World genus has been described as similar to *Distylium* and may be considered as in the Distylieae.

SYCOPSIS

Sycopsis Oliv. in Trans. Linn. Soc. 23: 83. pl. 8. 1860. — Based on the single species *S. Griffithiana* Oliv., from Assam, India.

Flowers unisexual and monoecious or andromonoecious in separate or the same axillary headlike spikes or racemes, these bracteate, the lower bracts in some species broad, imbricate, involucre-like enclosing the unopened flowers, the bracts below individual opened flowers 2 or more, sometimes on sides of urceolate receptacle. Sepals 1 to 5, irregular, small, resembling the bracts, on upper edge of receptacle. Petals none. Staminate flowers in short compact spikes or glomerules, the pistils wanting or very rudimentary, the stamens 7 to 10 on edge of a more or less enlarged globose to urceolate receptacle, the filaments of varying lengths, the anthers basally attached, 2-celled, ellipsoid, dehiscent by widely spreading longitudinal slits, the connective often protruding as a point. Pistillate or perfect flowers with bicarpellary, 2-celled, setose-pilose, free ovary surrounded by the globose to urceolate, lepidote receptacle-tube bearing 1 to 5 sepals and 1 to 10 reduced or mature stamens and closely investing the 2 free, elongate, diverging, slender, glabrous styles, the stigmatic surfaces elongate, papillose on inner sides of styles; ovules solitary in each cell, pendant. Fruits subglobose, woody, 2- or 4-valved, setose-pilose capsules, splitting longitudinally, first perpendicular to the common partition between the two carpels, thus permitting the two seeds to escape, later the 2-pointed apex of each valve more or less splitting, the carpellary walls separating into two layers, the inner (endocarp) ligneous and somewhat thicker than the outer, the 2 seeds ovate-oblong, shining, brown or whitish with impressed whitish hilum. Leaves simple, alternate, coriaceous, evergreen, petiolate, glabrous, lepidote or velutinous, entire or with a few rather remote teeth above the middle, the lateral nerves usually curved anastomosing (except in *S. laurifolia*), the petiole usually lepidote, the stipules small, lanceolate, caducous.

Spring-flowering evergreen trees or shrubs, usually in forests or woods, extending from New Guinea through the higher mountains in the Philippine Islands and central and southern China to Assam, India. At the Arnold Arboretum is a single sterile specimen, *Mrs. H. Greenway* 30, from Langbian Peak, Dalat, Annam, Indo-China, referable to this genus but insufficient for further identification.

KEY TO SPECIES

Flowers in heads or headlike spikes, in bud enclosed by dark brown imbricate involucre bracts.

Leaves glabrous or stellate-pubescent beneath when young; leaf bases cuneate; blades 4 to 8 cm. long, entire; India.....1. *S. Griffithiana*.

Leaves glabrous or lepidote beneath when young; leaf bases obtuse to rounded; blades 5 to 13 cm. long, entire or toothed above the middle; China..2. *S. sinensis*.

Flowers in spikes or racemes, not glomerate, not enclosed in bud by dark brown involucre bracts.

Leaves closely and densely tomentose beneath; lateral nerves not curved-anastomosing.....3. *S. laurifolia*.

Leaves glabrous beneath; lateral nerves curved-anastomosing.

Blades of leaves ovate.

Apex of leaves acute or acuminate; petiole 1 to 1.5 cm. long.....4. *S. Dunnii*.

Apex of leaves broadly obtuse or rounded; petiole 5 mm. long or less.....

.....5. *S. Tutcheri*.

Blades of leaves narrowly or linear-lanceolate.....6. *S. salicifolia*.

1. *Sycopsis Griffithiana* Oliv. in Trans. Linn. Soc. 23: 83. *pl.* 8. 1860; Brandis, Indian Trees. 301. 1906. Originally described from Khasi Hills, Assam, India, without mention of specimens, the type in all probability being *Griffith 3375* at Kew (see discussion below).

A branching shrub or small tree, the branchlets minutely puberulent or lepidote when young, glabrescent. Leaves with channeled glabrous or lepidote petiole up to 7 mm. long, the blade elliptic-ovate, generally slender acuminate at apex, cuneate at base, 4 to 8 cm. long, 2 to 3 cm. wide, entire, glabrous (stellate-pubescent when young—according to Clarke), the midrib and about 8 pairs of lateral nerves slightly impressed above, raised beneath, curved-anastomosing. Flowers in subglomerate, stellate-pubescent heads or headlike spikes, bracteate at base, the lower portion of the calyx tube adnate to the ovary, the free portion pubescent within (according to Brandis). Stamens up to “8 (of which number several appear abortive)” (according to Hooker). Capsules globose or ovoid, about 1.5 cm. long, with ruptured lepidote receptacle tube at base.

INDIA: Assam: *Griffith 3375* (G—*isotype*).

Henry 11464, from Yunnan, has been referred by A. Rehder and E. H. Wilson (in Sarg. Pl. Wils. 1: 431. 1913) to this species, but this collection has not been examined in the course of this study.

In the discussion following the original description Oliver says: “The foregoing description . . . rests upon specimens met with in the course of arrangement of the late William Griffith’s herbarium. These, although very numerous, appear to be all of one gathering, and, unfortunately, are almost all a little too far advanced to enable me to furnish, from a sufficient number of female flowers, complete details of their earlier condition . . . It is not improbable that they may have been obtained by some of the collectors despatched . . . to the Khasia Hills.” Neither the original description nor Hooker’s *Flora of British India* mentions any collector’s number for Griffith’s specimen, but a specimen in the Gray Herbarium bears the data “Herbarium of the late East India Company, no. 3375. East Bengal. Herb. Griffith. Distributed at the Royal Gardens, Kew, 1863–4.” The specimen conforms with the original description and excellent drawing. Its

distribution from Kew in 1863-4, subsequent to the publication in 1860 of this species, suggests its having been numbered, and possibly geographically labeled, subsequent to its study by Oliver. The failure to include the collector's or herbarium number in the Flora of British India 2: 427. 1878 is unfortunate, for it could probably have been easily supplied. As no other collections of this species are mentioned in the literature examined, it may be assumed that the Gray Herbarium specimen of *Griffith* 3375 is an isotype. The type is doubtless at Kew.

2. *Sycopsis sinensis* Oliv. in Hook. Ic. Pl. 20: *pl.* 1931. 1890, 29: *pl.* 2834. 1907. — Based on *Henry* 6019, 7574, 7574b, and 7825, from Yunnan, in the Kew herbarium. Duplicates of the first two syntypes have been examined.

Sycopsis sinensis var. *integrifolia* Diels in Bot. Jahrb. 29: 381. 1900. — Type, *von Rosthorn* 2261, from Szechwan, in the Berlin herbarium. Photograph and fragment examined.

A tree up to 14 m. high with trunk diameter up to 45 cm., the bark brown or gray, smooth, longitudinally fissured, the branchlets grayish, stellate-lepidote, glabrescent. Leaves with densely stellate-lepidote petioles 1 to 1.5 cm. long, the blades elliptic-ovate to slightly obovate, sometimes lanceolate, acuminate at apex, obtuse to rounded at base, 5 to 13 cm. long, 2.5 to 5 cm. wide, entire or with 1 to 5 callose teeth above the middle, glabrous, more or less lepidote beneath, paler and glaucous beneath when fresh, the lateral nerves about 6 pairs, more or less impressed above, somewhat raised beneath, curved-anastomosing. Flowers in short peduncled subglomerate heads or headlike spikes, enclosed in bud by broad ferruginous, pubescent, imbricate, involucre bracts, in fruit reaching 2 cm. long, the sepals about 3, ovate, about 1 mm. long, hairy on outside. Stamens 10, the anthers red, apiculate, slightly curved, the filaments glabrous, up to 1.5 cm. long in staminate flowers. Capsules globose, about 8 mm. long, with ruptured receptacle tube around base.

DISTRIBUTION: China. In thickets, woods, and deep forests.

CHINA: Szechwan: Ping Shan Hsien, *F. T. Wang* 22815 (A); Kweichow: Yinking, *Y. Tsiang* 7658, 7667, 7685, 7687, 7910 (Y); Hupeh: Chang Yang Hsien, *E. H. Wilson* (Arnold Arb. Exp.) 2586 (A, G, W); Patung Hsien, *Ho-ch'eng Chow* 855 (A, Y); Siu Yueh Sie (Sin Yeh Su?), *W. Y. Chun* (Herb. Univ. Nanking 4068) (A), *W. Y. Chun* 3726 (A); S. Wushan, *E. H. Wilson* (Veitch Exp.) 1825 (A, W, Y); no specific locality, *A. Henry* 6019 (G, W, Y), 7574 (A, G, W, Y), *E. H. Wilson* (Veitch Exp.) 727 (W, Y); Hunan: Hang Shan, *C. S. Fan & Y. Y. Li* 404 (A); southern Anhwei: Western Wu Yuan, *R. C. Ching* 3250 (A); Kiangsi: Woo Kung Shan, An Fu, *H. H. Hu* 702 (A); Kunnan Hsien, Sai Hang Cheung, near Tung Lei village, *S. K. Lau* 4059 (A, W), 4329 (A, W); Hwangdschou-ling, between Dingdschou and Ningdu, Kiangsi-Fukien border, *Handel-Mazzetti* 378 (A); southern Chekiang: King Yuan region, *R. C. Ching* 2387 (A, G, W, Y).

3. *Sycopsis laurifolia* Hemsl. in Hook. Ic. Pl. 29: sub *pl.* 2836 (p. 2). 1907; K. Y. Tong, Stud. Hamamel. 37. 1926. — Type, *Henry* 11365,¹¹ from Mengtze, Yunnan, in the Kew herbarium. Duplicate examined. FIG. 4.

A shrub 3 m. high or a tree up to 15 m., the branchlets grayish, abundantly lenticellate, lepidote when young. Leaves with densely puberulent or lepidote petioles 1 to 1.8 cm. long, the blades elliptic-ovate, acute or

¹¹The type was cited as 14365, but this is apparently a misprint for 11365, as noted in Sarg. Pl. Wils. I: 431. 1913, and as seen from a photograph at the New York Botanical Garden of the type at Kew.



FIG. 4. *Sycopsis laurifolia*, drawn from an isotype (A), $\times \frac{1}{2}$.

acuminate at apex, acute to obtuse at base, 6 to 10 cm. long, 2.5 to 4.5 cm. wide, entire, glabrous above, much paler and finely and densely velutinous beneath, the lateral nerves 4 or 5 pairs conspicuous beneath, the lower pair sometimes longer and more acutely diverging from the midrib than the others, none prominently anastomosing, connected by rather conspicuous scalariform tertiary nerves. Flowers in spikes or racemes not distinctly subglomerate and enclosed in involucre bracts in bud, reaching 2 cm. long in fruit, the bracts 2 to 4 at base or on receptacle tube, hairy, the sepals 0 to 2, hairy. Stamens up to about 6, about 4 mm. long, the anthers apiculate, the filaments variable in length. Capsule globose, more or less pointed, about 1 cm. long, entirely enclosed in the brownish lepidote receptacle tube (always?).

CHINA: Yunnan: Mengtze, A. Henry 11365 (A — isotype), 11365 A (A, W, Y); Ping Pien Hsien, H. T. Tsai 62636 (A).

This species is readily recognized by its velutinous lower leaf surfaces and nerves ending at the margin, not curved-anastomosing.

4. *Sycopsis Dunnii* Hemsl. in Hook. Ic. Pl. 29: pl. 2836. 1907. — Type, S. T. Dunn (Herb. Hongkong 2695), from Fukien, in the Kew herbarium (see discussion below). Photograph and rubbing examined.

Sycopsis philippinensis Hemsl. in loc. cit. (p. 2). — Type, Loher 4881, from Baguio, Luzon, Philippine Islands, in the Kew herbarium. Duplicate examined.

Croton curviflorus Elmer, Leaf. Philip. Bot. 1: 310. 1908. — Type, A. D. E. Elmer 8651, from Baguio, Luzon, Philippine Islands, in the Manila herbarium. Duplicate examined.

A shrub or tree up to 10 m. high.¹² the branchlets grayish or brownish, glabrous or scattered lepidote when young. Leaves petiolate, the petiole 1 to 1.5 cm. long, at least the lower part densely lepidote with large scales, the upper part in most eastern continental specimens more slender and narrowly margined and not lepidote, the blades elliptic-ovate, acute to acuminate at apex, subrounded, obtuse, acute or acuminate and somewhat narrowly decurrent at base, 5 to 10 cm. long, 2 to 5 cm. wide, entire, glabrous or stellate-lepidote on both surfaces when young, the midrib and 6 or 7 pairs of lateral nerves impressed above, raised beneath, curved-anastomosing. Flowers in lepidote, few-flowered short spikes or racemes reaching 2.5 cm. long in fruit, especially short in all staminate inflorescences but not covered with involucre bracts in bud, the bracts at base or on the receptacle tube, ovate, the sepals about 6, oblong-ovate or ovate, about 1.5 mm. long, glabrous or hairy. Stamens up to 10, the anthers about 2 mm. long, apiculate, the pollen brown, the filaments 2 to 5 mm. long, rather slender. Capsules 1 or 2 in each inflorescence, subglobose, about 1 cm. long, with ruptured receptacle tube surrounding about the lower half. Seeds brown or whitish.

DISTRIBUTION: From Yunnan and Fukien in China to the Philippine Islands, Celebes, and New Guinea. Woods, forests and grassy slopes.

CHINA: Southern Yunnan: Banks of Nam Ha, between Muang Hai and Keng Hung, *J. F. Rock* 2466 (A, W); Kwangsi: Hung Hsien, Ta Tze Shan, *A. N. Steward & H. C. Cheo* 827 (A, Y); Yünn Hsien, Na Kan-Lin, *A. N. Steward & H. C. Cheo* 165, 170, 199 (A, Y); Shap Man Tai Shan, *W. T. Tsang* 22362 (A); Tong Shan, *W. T. Tsang* 22795 (A); Kwangtung: Kook Kiang Dist., Lung Tau Shan, *S. P. Ko* 50161, 50209 (Y); Hongkong, New Territories, Tai Mo Shan, *W. T. Tsang* 21092 (A, Y); Fukien: Kutien, *H. H. Chung* 4008, 4009 (A); Yenping, *Kuang-han Chou* 8704 (A); no precise locality, *H. H. Chung* 7917 (A), *S. T. Dunn* (Herb. Hongkong 2696, 2697) (A). PHILIPPINE ISLANDS: Luzon: Benguet Subprov., Baguio, alt. 1500 m., *A. D. E. Elmer* 8651, 8688 (A, W), *C. Garcia* (For. Bur. 25506) (G, Mo), *A. Loher* 4881 (W), *J. K. Santos* 13 (A, Mo); Nueva Vizcaya Prov., Caraballo Mtn., *A. Loher* 13628 (A); Zambales Prov., Mt. Marayep, *Ramos & Edaño* (Bur. Sci. 44784) (A); Nueva Ecija Prov., Mt. Umingan, *Ramos & Edaño* (Bur. Sci. 26419) (A, W); Bataan Prov., Lamao Forest Reserve, *Curran* (For. Bur. 6246) (W, Y); Tayabas Prov., Mt. Camatis, *Alcasid & Edaño* (Philip. Nat. Herb. 4988) (A); Rizal Prov., Balabano, *A. Loher* 13081 (A); Mt. Susong-Dalaga, *Ramos & Edaño* (Bur. Sci. 29326) (W); no precise locality, *M. Ramos* 1999 (G, Mo, Y); Laguna Prov., Mt. Banajo, *Curran & Merriitt* (For. Bur. 7923) (W); Batangas Prov., *C. Mabesa* (For. Bur. 28053) (A); Mindoro: Paluan, *M. Ramos* (Bur. Sci. 39604) (A, W); Palawan: Mt. Balogbag, 1200 m. alt., *G. Edaño* (Bur. Sci. 77801, For. Bur. 77805) (Y); Dinagat: *Ramos & Convocar* (Bur. Sci. 83922) (Y). CELEBES: "En Ond. Gowa, Lembaja, Beroe," 1600 m. alt., *Netherlands Indies Forest Service* (Herb. Hort. Bot. Bog. BB 20432, BB 20433) (A); "Sum. Atjeh en Ond. Gajo Locëus Penosan (Gn. Geroepal)," about 2200 m. alt., *Netherlands Indies Forest Service* (Herb. Hort. Bot. Bog. BB 22366) (A); "en Ond. Masamba, Borschaft, Takalaki, Malili," 2200 m. alt., *Netherlands Indies Forest Service* (Herb. Hort. Bot. Bog. BB 23361) (A). BRITISH NEW GUINEA: Central Division, Vanapa Valley, probably at Ononge, *Father Dubuy* (without number) (A).

¹²Hemsley's description of *S. Dunnii* says "arbor 9-10 m. alta," but the specimens here cited, so far as data are available, indicate that this species is a shrub up to 5 m. high. Available duplicates of specimens studied by Hemsley bear no habit, habitat, or descriptive data. Elmer describes it as a "tree-like shrub or erect tree, 10 m. high with rather short numerous branched ascending branchlets."

Careful comparison of Chinese and Philippine specimens shows few differences, these appearing to be of less significance than the variations found within either supposedly distinct species. There are no good male flowers from the Philippines, and the fruiting inflorescences seem to have fewer fruits. The tendency of the leaf bases in most of the Chinese specimens to be cuneate and somewhat narrowly decurrent on the petiole above the lower densely lepidote part of the petiole is only slightly suggested in the Philippine material. Obtuse to subrounded leaf bases are fairly common in the Philippine material but rare in the Chinese material. However, *Rock 2466* has broadly obtuse and rounded leaf bases and larger leaves. Furthermore it is reported by the collector as a "tree 50 ft.," which is considerably larger than is noted for any of the remaining material from China or the Philippines. There are no significant differences in the original descriptions of the Philippine and Chinese species. There seems, therefore, little reason to maintain distinct species for the material from these two areas, or to consider the *Rock* specimen as representing a distinct species.

At the New York Botanical Garden is a photograph of a Kew specimen of this species bearing two labels, *Dunn* (Herb. Hongkong 533) and (same) no. 2695. The specimen on this sheet is large and ample, but so far as can be determined there are no stamens in the flowers. There is a pocket labeled 533. As the original description cites only "533, 2695," and as the 533 part of the Kew specimen is apparently a fragment, *Dunn* (Herb. Hongkong 2695) at Kew should be considered the type. The original citation of this species describes and illustrates the apparently non-functioning stamens from an otherwise pistillate plant. There is another photograph in the New York Botanical Garden of a Kew specimen labeled at the top "Hongkong herb. nos. 2697 = 1340," to which is attached a drawing in pencil bearing a pocket stating it to contain a "stamen taken from specimen, W. B. H. 1907," the drawing labeled "Ic. Pl. 2836. *Sycopsis* 2696 & 737. Returned to Hongkong." Comparison of this drawing with that of the plate published with the original description reveals strong evidence that it is the original rough draft. Thus the original description and illustration in respect to abortive stamens were based on the Hongkong specimen of 2696, which was not cited with the original description. However, all these specimens seem to represent the same species.

In discussing and citing additional specimens of *S. Dunnii* Hemsl., W. Y. Chun (in *Sunyatsenia* 1: 245. 1934) mentions the aberrant characters of *S. P. Ko* 51428 from Kwangtung, and suggests it might prove to be new. It has "small spatulate-obovate leaves abruptly attenuate to a long petiole, and very small capsules." This collection has not been seen.

5. *Sycopsis Tutcheri* Hemsl. in Hook. Ic. Pl. 29: pl. 2834. 1907. — Type, *W. J. Tutchet* (Herb. Hongkong 1340), from Hongkong, in the Kew herbarium. Duplicates examined.

A shrub about 2 m. high in Hongkong, a tree up to 12 m. in Hainan, the branches dense, dark gray, glabrous, scattered lepidote when young. Leaves with densely lepidote petioles up to 5 mm. long, the blade elliptic-ovate or slightly obovate, broadly obtuse to rounded at apex, acute to obtuse at

base, 4 to 6 cm. long, 2 to 3 cm. wide, entire, glabrous, slightly paler beneath, the lateral nerves 5 pairs, generally inconspicuous above, slightly raised beneath, curved-anastomosing. Flowers in short lepidote spikes or racemes up to 1.5 cm. long, the bracts irregular, ovate, the sepals small, with a few hairs. Stamens "red" (according to Wilson), otherwise unknown. Capsules globose to ovoid, 1 to 1.3 cm. long, the lower third surrounded by the ruptured lepidote receptacle tube.

DISTRIBUTION: Southeastern China. In forests and mountain ravines.

CHINA: Kwangtung: Hongkong, New Territory, Tai Ue Mtn., *Fung Hom* (Lingnan Univ. Herb. 19462) (Y); Victoria Peak, Mtn. Lodge, Herb. Hongkong 9060 (A); east of Mtn. Lodge, *W. J. Tutcher* (Herb. Hongkong 1340) (A— isotype); south side of Victoria Peak, *E. H. Wilson*, Apr. 17, 1909 (A); Hainan: Mixed forests, *C. Wang* 36555 (A, Y).

A very distinct species, recognized by its glabrous, broadly obtuse leaf blades.

6. *Sycopsis salicifolia* H.-L. Li apud Walker, sp. nov.

Frutex circiter 3 m. altus, ramis cinereis, ramulis novellis cinereo-brunneis, puberulis vel glabris. Foliorum petiolus brevis, 3–4 mm. longus; lamina subcoriacea lineari-lanceolata, 7–10 cm. longa, 0.8–1.8 cm. lata, acuta vel breviter acuminata, basi attenuata, supra viridis, subtus pallidior, margine integra leviter revoluta, nervis lateralibus utrinsecus 5–8, utrinque inconspicuis vel subconspicuis, arcuato-adscendentibus, prope marginem confluentibus, rete venularum obscuro. Inflorescentiae breves pauciflorae racemosae. Flores bracteati, bracteis ovatis, 2–4 mm. longis, puberulis, calycis tubo minuto, saltem 2–3 mm. longo, puberulo, margine 4-lobato, lobis oblongis 2–3 mm. longis, caducis; staminibus 6–8, filamentis 2–4 mm. longis, antheris oblongis, 2–3 mm. longis, apice rostratis; ovario nullo vel si praesente tomentoso, stylis gracilibus 5–6 mm. longis, leviter puberulis. Fructus immaturus calycis tubo inclusus. [Description by Li]

CHINA: Hainan: Bo Ting, in thickets, *S. K. Lau* 27953 (A) (TYPE), 27956 (A), Oct. 10, 1936.

This is a distinct species, strongly characterized by its linear-lanceolate leaves. *Lau* 27953 is a flowering specimen, bearing both staminate and perfect flowers, which are similar in appearance. *Lau* 27956 has young fruits only.

Note: The author will furnish on request, without cost, a mimeographed list of the specimens cited in this paper arranged alphabetically and numerically by collectors.

U. S. NATIONAL HERBARIUM,
WASHINGTON, D. C.

THE COMPARATIVE MORPHOLOGY OF THE WINTERACEAE V. FOLIAR EPIDERMIS AND SCLERENCHYMA

I. W. BAILEY AND CHARLOTTE G. NAST

With three plates

FOLIAR CUTICLE

THE dried leaves of specimens of the Winteraceae frequently have a more or less conspicuously glaucous under surface, which fluctuates from faintly grayish to an intense uniform white. This glaucescence resolves under comparatively low magnifications into a number of distinct patterns. In most cases, the under surface of the leaf is speckled with white dots, *Figs. 1-6*. These dots vary in size and in number per unit area. They may be uniformly distributed and widely spaced, *Fig. 2*, or they may be aggregated and apparently coalesced in diverse patterns, *Fig. 3*. Furthermore, they may be surrounded by brownish tissue, *Figs. 1* and *2*, or they may be embedded in a grayish or white layer that coats the entire under surface of the leaf, *Figs. 4-6*. In extreme cases, e.g. leaves of certain collections of *Drimys granadensis* L. f., *D. brasiliensis* Miers, and *Pseudowintera axillaris* var. *colorata* (Raoul) A. C. Sm., the white layer may be so compact and thick that no spots are detectable within it.

The white spots are due to minutely granular or finely alveolar deposits in the oval or circular depressions in which the stomata are situated, *Figs. 7* and *8*. The alveolar substance covers the guard cells, *occluding the orifice*, and commonly extends outward over the adjacent subsidiary cells. In such leaves as those illustrated in *Figs. 1* and *2*, the finely alveolar material is localized over and about the stomata, whereas in those shown in *Figs. 4-6* it extends across the intervening areas, but in a thinner or less homogeneous form. Only in exceptional cases is the entire surface covered by a thick uniform layer of finely alveolar material which conceals the location of the stomata.

The white color is due to the presence of air in the interstices of the incrusting material. This may be demonstrated by dropping a glaucous leaf in boiling water. The leaf turns brown as the air is displaced by hot water, and the white color returns as the leaf is re-dried. This raises an important question regarding the extent to which the glaucescence of winteraceous leaves may be modified by differences in the drying or curing of herbarium specimens. The leaves of different collections of the same species frequently vary in color from brown to white. Not infrequently different leaves of the same collection or even of the same sheet exhibit similar variations in glaucescence. The conspicuously glaucous leaves of certain sheets exhibit more or less extensive brown discolored areas. A detailed microscopic examination of such discolored leaves indicates that

there was a migration and exudation of sap in the discolored tissue. As this sap evaporated, it left a brownish residue in the minute interstices of the incrusting material. The occurrence of browning during drying is dependent in part upon the structure and condition of the leaves and upon the thickness of the incrusting material.

We have found more or less conspicuous white stomatal areas on the leaves of most investigated species and varieties of all six genera of the Winteraceae. Thus the occlusion of stomata by deposits of minutely alveolar material appears to be an outstanding characteristic of the family. Where the stomatal plugs are not clearly discernible in ordinary surface views of the leaves, microscopic analyses of transverse sections demonstrate that they are concealed by papillae (*Drimys brasiliensis* pro parte), *Fig. 11*, by excessively thick layers of glaucescent material (e.g. certain collections of *D. granadensis* vars. *mexicana* (DC.) A. C. Sm. and *grandiflora* Hieron.), *Figs. 9* and *10*, or have been infiltrated with brownish residues during drying.

Since the publication of De Bary's (2) "Vergleichende Anatomie," granular, areolate, rod-like, and other types of structures on the outer surface of cuticles have commonly been referred to as wax or waxy coatings. It is significant in this connection, however, that although the incrusting material of the Winteraceae stains in Sudan III and is optically anisotropic, it does not melt in boiling water and is insoluble in boiling alcohol, hot ether, and other non-polar solvents. Thus, it exhibits none of the properties that are commonly assumed to be characteristic of plant waxes and, therefore, differs from the glaucescence of certain Magnoliaceae and Schisandraceae which is soluble in boiling alcohol and in ether at room temperature. The question arises, accordingly, whether the seemingly incrusting material of the Winteraceae is a distinct layer of different chemical composition or merely a physically different (i.e. more porous) outer part of the cuticle. The thick cuticles of the Winteraceae, as of many other plants, exhibit numerous intergradations between putative homogeneity and more or less conspicuously striated, lamellated, areolated, granular, ribbed, fluted, and warty structures. At present, there is no convincing evidence to suggest that any one of these diverse morphological forms is indicative necessarily of a waxy rather than of a cutinaceous composition.

As previously stated, the stomatal plugs of the Winteraceae usually have a uniform and finely alveolar structure, *Figs. 7* and *8*. They commonly grade off marginally (i.e. in the inter-stomatal areas) and more or less abruptly into varying admixtures of finely alveolar and coarsely granular or warty structures, which may grade in turn into more or less extensive and irregular patches of relatively homogeneous material. In certain cases, the entire under surface of the leaf may have a relatively thick coating of finely alveolar material upon which irregular masses of homogeneous material are superimposed, *Figs. 9* and *10*. The thick cuticle of the inter-stomatal areas is three-layered, *Fig. 10*, consisting of a homogeneous layer which grades into an alveolar layer which grades in turn into irregular

masses of homogeneous material. Since there are all intergradations of texture, it seems likely that the finely alveolar material of the Winteraceae may represent a physically porous phase of the chemically complex, cuticular emulsion. In many families, there obviously is a segregation of specific constituents (e.g. wax) of this complex emulsion upon the outer surface of the cuticle, but there are no *a priori* reasons for assuming that this must necessarily occur in the Winteraceae.

Our colleague, Dr. Smith (3), with whom we are collaborating in the study of woody ranalian families, has shown that the white stomatal areas are of some taxonomic significance in the classification of the Winteraceae. The consistent plugging of the stomata makes the family of interest from physiological and ecological points of view, and leads one to wonder whether there is any significant correlation between the peculiar stomatal and vascular structures within the family. The fact that there is no comparable plugging of the stomata in the vesselless *Tetracentron* and *Trochodendron* renders untenable any teleological inferences regarding the absence of vessels in the Winteraceae. The tendency toward reduction of scalariform pitting in the family might, however, be correlated with reduced transpiration through plugging of the stomata. It is of interest in this connection that the Coniferae (where scalariform bordered pits have been eliminated from both the metaxylem and the secondary xylem) are characterized by having stomata that are plugged with finely alveolar material.

PAPILLATE EPIDERMIS

The aerial organs of the Winteraceae with the notable exception of the carpels are characteristically glabrous. In certain cases, hairs are formed along the margins of bud scales and of young leaves, but the only tendency toward the formation of extensively distributed hairy structures on mature leaves is the papillate, lower epidermis of *Drimys brasiliensis*, Fig. 11. Most specimens of the four varieties of this species, vars. *campestris* (St. Hil.) Miers, *retorta* (Miers) A. C. Sm., *angustifolia* (Miers) A. C. Sm., and *roraimensis* A. C. Sm., exhibit papillate surfaces, but certain collections of var. *campestris* (Burchell 3567, Claussen 1064, Dusén 14504, Hoehne 1205 and 28700, Lützelberg 268, and Miers 4604) do not. The papillae fluctuate considerably in form, length, and breadth, and in the character of their cuticular covering, which varies from finely alveolar to coarsely granular or warty. The absence of papillate surfaces in certain collections of *D. brasiliensis* var. *campestris* is not correlated with other significant morphological differences. Nor is the geographical distribution of these collections indicative of a stable glabrous variety of *D. brasiliensis*. As Dr. Smith (3) has shown, the morphological characters of the New World (*Wintera*) section of *Drimys* are relatively unstable. The various taxonomic entities are not sharply defined and may be differentiated only by their general trends of morphological specialization. Thus, the papillate character is variable and unstable in *D. brasiliensis* and by itself cannot be relied upon in differentiating taxonomic entities.

FOLIAR SCLERENCHYMA

The leaves of the Winteraceae fluctuate markedly in texture and thickness and exhibit corresponding variations in their internal structure. The cells of the epidermis and mesophyll vary in size, form, and arrangement, in the thickness of their walls, and in the character of their pitting. The cellular characters fluctuate so markedly within species and apparently also within different leaves of the same individual that it is difficult to utilize such characters in differentiating taxonomic entities without examining a much wider range of material than is available at present. There are, however, certain structures and certain trends of specialization in the leaves of the Winteraceae that deserve mention. The stomata of the Winteraceae are characterized by having from 2 to 6 subsidiary cells oriented parallel to the guard cells. The leaves of the family are also characterized by the presence of numerous spherical secretory cells such as occur in the cortex and pith of the stem and in the floral organs. Since both of these cellular characters are of common occurrence in woody ranalian families, they are not indicative of close relationship to any one of these families.

As indicated in the preceding paper (1) of this series, the larger foliar veins are jacketed by sclerenchyma in the *Wintera* section of *Drimys*, whereas the terminal veinlets are not, the only lignified elements being spirally or reticulately thickened tracheids, *Figs. 13 and 15*. The sclerenchymatous jackets of the larger veins are composed of slender, elongated, thick-walled cells. The leaves of this section of *Drimys* form, in addition, more or less numerous large, armed sclereids that are scattered through the spongy part of the mesophyll, *Figs. 13 and 15*. These sclereids are conspicuous features of the leaves of *D. brasiliensis* and *D. granadensis*, being poorly developed or absent in only a few collections of these species. On the contrary, they are absent or feebly developed in *D. Winteri* var. *andina* Reiche. They fluctuate in abundance in *D. confertifolia* Phil., *D. Winteri* var. *punctata* (Lam.) DC., and *D. Winteri* var. *chilensis* (DC.) A. Gray. In var. *punctata* of *D. Winteri*, they tend to be more numerous on either side of the midrib, whereas in var. *chilensis* they frequently tend to be unevenly thickened and to be associated with smaller more nearly isodiametric thick-walled cells.

In the *Tasmannia* section of *Drimys*, both the coarser veins and the terminal veinlets usually are embedded in more or less massive sclerenchymatous jackets, *Figs. 14 and 18*. Only infrequently does one encounter a specimen having terminal veinlets of the type which characterizes the *Wintera* section of the genus. In most cases, the veins have an inner jacket of elongated thick-walled cells and, in addition, an outer layer of shorter, broader lignified cells whose secondary walls fluctuate considerably in thickness in different specimens, *Figs. 14 and 18*. Interspersed sclereids, of the type which are formed so commonly in the *Wintera* section of *Drimys*, are of exceptional occurrence, having been encountered by us only in certain atypical specimens of *Drimys Brassii* A. C. Sm., *D. hatamensis* Becc., and

D. reticulata Diels. These interspersed sclereids are, however, conspicuously smaller and have less extensively projecting arms than those of the *Wintera* section. Such sclereids, of the type shown in *Fig. 17*, are of more frequent occurrence in *Pseudowintera axillaris* var. *colorata* (Raoul) A. C. Sm., but the veinlets of this plant, as of var. *typica* A. C. Sm., are somewhat intermediate in structure between those of the *Wintera* and the *Tasmannia* sections of *Drimys*.

In the six species of *Belliolum* available to us, the veins and terminal veinlets have sclerenchymatous jackets of the *Tasmannia* type. Isolated, lignified, thick-walled cells and clusters of sclereids are of sporadic occurrence in the leaves of *B. rivulare* v. Tiegh. (*Vieillard 2278*). The cells of the mesophyll in leaves of *B. crassifolium* (Baill.) v. Tiegh. (*Schlechter 15348*) have curious lignified reticulate thickenings, such as were encountered by van Tieghem (4) in the leaves of *B. Pancheri* (Baill.) v. Tiegh. and *B. Vieillardii* v. Tiegh. We have not observed such thickenings, however, in the leaves of *B. Burtianum* A. C. Sm. (*Kajewski 1680*), *B. gracile* A. C. Sm. (*Brass 2898*), *B. haplopus* (Burt) A. C. Sm. (*Kajewski 1994*), *B. Kajewskii* A. C. Sm. (*Kajewski 2099*), and *B. rivulare* v. Tiegh. (*Vieillard 2278*).

In the leaves of the 17 species of *Bubbia* examined by us, the veins and terminal veinlets have sclerenchymatous jackets of the *Tasmannia* type, *Fig. 16*, but the mesophyll exhibits a wide range of structural variability. The cells of the mesophyll may have walls of relatively uniform thickness, *Fig. 16*, or they may have lignified reticulate thickenings as in certain collections of *Belliolum*. Isolated, interspersed, lignified, thick-walled cells, *Fig. 17*, which vary in form, abundance, distribution, and wall thickness, occur in more than half of the species examined by us. More or less massive clusters or nests of sclereids, *Fig. 12*, are formed in a number of species. In *B. pachyantha* A. C. Sm. (*Brass 4371*), they occur in association with interspersed, isolated sclereids; in *B. isoncurea* v. Tiegh. (*Vieillard 17*), *B. semecarpoides* (F. v. Muell.) Burt (Kajewski 1216), *B. sylvestris* A. C. Sm. (*Clemens 41142*), and *B. Whiteana* A. C. Sm. (*Kajewski 1495*), they occur among reticulately thickened mesophyll cells. It is of interest that, as shown in *Figs. 12* and *17*, the structure of the leaf may fluctuate markedly in different collections of the same species. In *B. sylvestris*, the walls of the mesophyll in *Clemens 41800* are of relatively uniform thickness throughout, whereas in *Clemens 4463* they are provided with reticulate thickenings, and in *Clemens 41142* with such thickenings in association with conspicuous nests of sclereids.

There is an even wider range of variability in the foliar structures of *Zygogynum*. Thus, the terminal veinlets of *Z. pomiferum* Baill. (*Balansa 2328*) and *Z. spathulatum* v. Tiegh. (*Vieillard 2266*) are without well developed sclerenchymatous jackets, the cells of the mesophyll have relatively uniform thickenings, and there are no interspersed sclereids or nests of sclereids. On the contrary, in *Z. Bailloni* v. Tiegh. (*Franc*), *Z. bicolor* v. Tiegh. (*Lécart 41*), and *Z. Vieillardii* Baill. (*Franc 1740*), the veins and

terminal veinlets are of the *Tasmannia* type, the cells of the mesophyll have reticulate types of thickenings, and both armed thick-walled cells and nests of sclereids are scattered through the mesophyll. The veins and veinlets are of the *Tasmannia* type in both species of *Exospermum*, *E. Lecarti* v. Tiegh. (*Lécart 144*) having a reticulately thickened mesophyll and *E. stipitatum* (Baill.) v. Tiegh. (*Vieillard 2281*) a thin-walled one with scattered more or less isodiametric sclereids.

The available evidence indicates that internal foliar characters are unstable and variable in the Winteraceae, particularly in the genera *Belliolum*, *Bubbia*, and *Zygogynum*. Much more extensive collections must be studied before attempting to utilize such characters as an aid in differentiating taxonomic entities. Sufficient material has been analyzed, however, to indicate that there are certain significant trends of foliar specialization in the Winteraceae. In the *Wintera* section of *Drimys*, increasing coriaceousness is attained largely by the formation of large, armed sclereids interspersed through the mesophyll, *Figs. 13* and *15*. On the contrary, in the *Tasmannia* section of *Drimys*, sclerification progresses along the veins and veinlets, the bulk of the mesophyll remaining thin-walled, *Figs. 14* and *18*. In *Belliolum*, *Bubbia*, and *Zygogynum*, increasing coriaceousness commonly involves intensified sclerification along the veins and veinlets, *Fig. 16*, the formation of interspersed sclereids and clusters of sclereids, *Figs. 12* and *17*, and not infrequently the formation of lignified thickenings throughout the mesophyll. In the more coriaceous species of *Bubbia* and *Zygogynum*, all three trends of sclerification may occur simultaneously.

As noted by van Tieghem (4), there are conspicuous variations in the occurrence and distribution of sclerenchymatous cells in the stems and petioles of the Winteraceae. In the stem, each vascular strand of the eustele is capped externally by slender thick-walled fibers and is subtended internally by elongated, lignified, thick-walled cells. During the earlier stages of the development of the secondary body, the external arcs of fibers may be fused into a more or less continuous ring of sclerenchyma by the sclerification of intervening parenchymatous elements. The later-formed secondary phloem is not stratified as in the Degeneriaceae, Magnoliaceae, and Annonaceae, but contains irregularly oriented patches of sclerenchymatous tissue. The pith and cortex may contain scattered sclerenchymatous cells of varied form, clusters of sclereids, or may be largely devoid of such structures. In general, there is a much more extensive sclerification of the cortex and pith in the Old World representatives of the Winteraceae. Particularly in the more coriaceous species of *Belliolum*, *Bubbia*, *Exospermum*, and *Zygogynum*, there tends to be an exaggerated development of clustered sclereids throughout the pith and cortex.

It should be mentioned in conclusion that crystal-bearing cells are of relatively infrequent occurrence in the lamina of winteraceous leaves. They have been observed by us only in *Bubbia Clemensiae* A. C. Sm. (*Clemens 4596*) and *Exospermum stipitatum* (Baill.) v. Tiegh. (*Vieillard 2281*). According to van Tieghem (4), there are no crystalliferous cells in the

stems and leaves of *Drimys*, but such cells occur in the stems of *Pseudowintera*, *Belliolum*, *Bubbia*, *Exospermum*, and *Zygogynum*, being commonly more or less closely associated with the medullary and cortical sclerenchyma.

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4. TIEGHEM, P. VAN. Sur les dicotylédones du groupe des Homoxylées. *Jour. de Bot.* 14: 259-297, 330-361. 1900.

EXPLANATION OF PLATES

PLATE I

Lower surface of dry leaves photographed with reflected light. Magnification $\times 40$.

FIG. 1. *Zygogynum Vieillardii* Baill., *Franc* 1740. FIG. 2. *Pseudowintera axillaris* var. *typica* A. C. Sm., *Kirk* 347. FIG. 3. *Bubbia longifolia* A. C. Sm., *Brass* 13868. FIG. 4. *Drimys piperita* Hook. f., *Elmer* 9912. FIG. 5. *Drimys Winteri* var. *chilensis* (DC.) A. Gray, *Hastings* 355. FIG. 6. *Drimys granadensis* var. *mexicana* (DC.) A. C. Sm., *Standley* 42319.

PLATE II

Figures 7-11: transverse sections of leaves stained with Haidenhain's haematoxylin and Sudan III and mounted in glycerin.

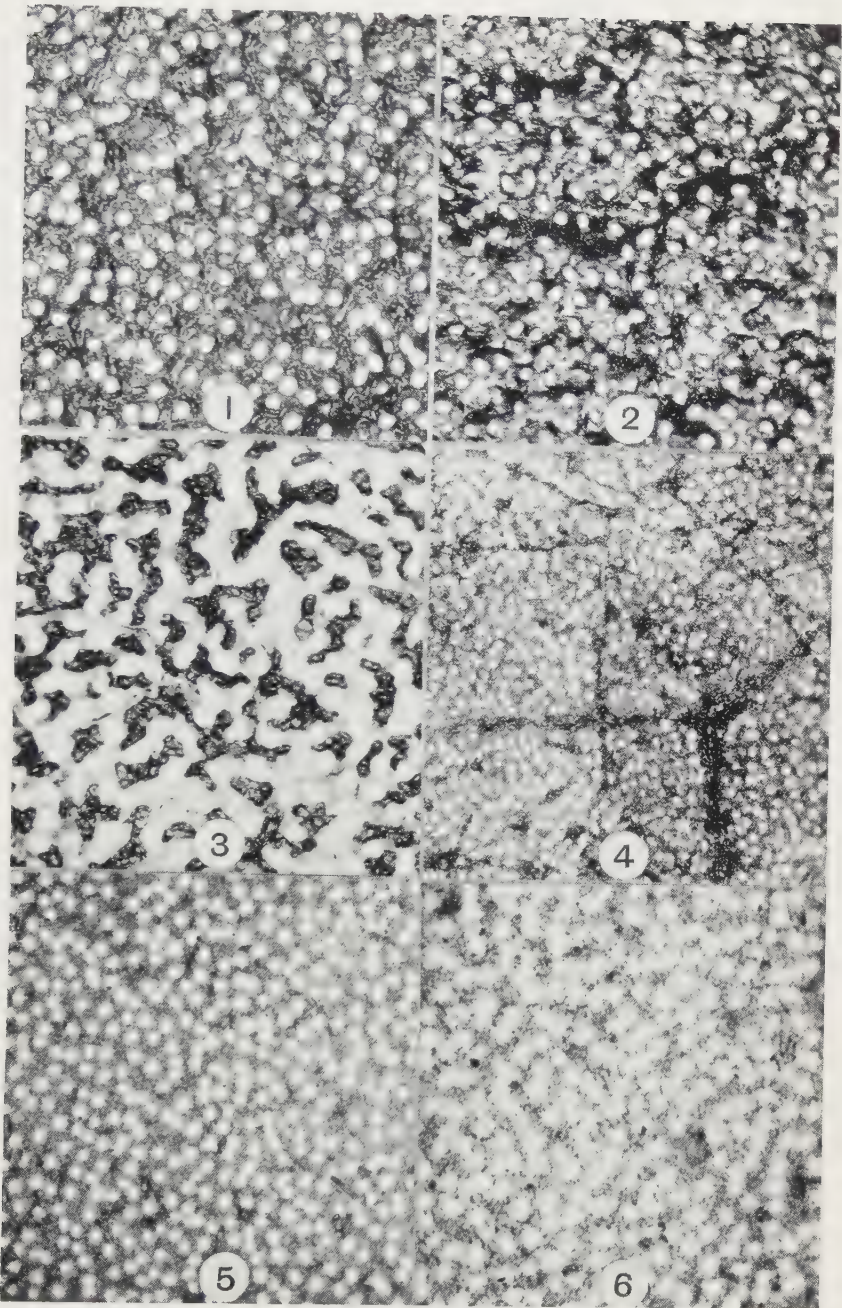
FIG. 7. *Zygogynum Bailloni* v. Tiegh., *Franc*. Showing occlusion of stoma by alveolar cutin, $\times 900$. FIG. 8. *Drimys Winteri* var. *chilensis* (DC.) A. Gray, *Sargent*. Showing occlusion of stoma by alveolar cutin, $\times 1180$. FIG. 9. *Drimys granadensis* var. *grandiflora* Hieron., *Holton* 673. Showing occlusion of stoma by internally alveolar and externally homogeneous cutin, $\times 900$. FIG. 10. *Drimys granadensis* var. *grandiflora* Hieron., *Triana*. Showing 3-layered cuticle in interstomatal region, the middle layer being alveolar, $\times 900$. FIG. 11. *Drimys brasiliensis* var. *campestris* (St. Hil.) Miers, *Mexia* 5791. Showing occluded stoma between two papillae, $\times 900$. FIG. 12. *Bubbia Whiteana* A. C. Sm., *Kajewski* 1495. Cleared leaf showing clusters of sclereids, $\times 80$.

PLATE III

Leaves cleared in hot dilute NaOH and mounted unstained in diaphane. Magnification $\times 145$.

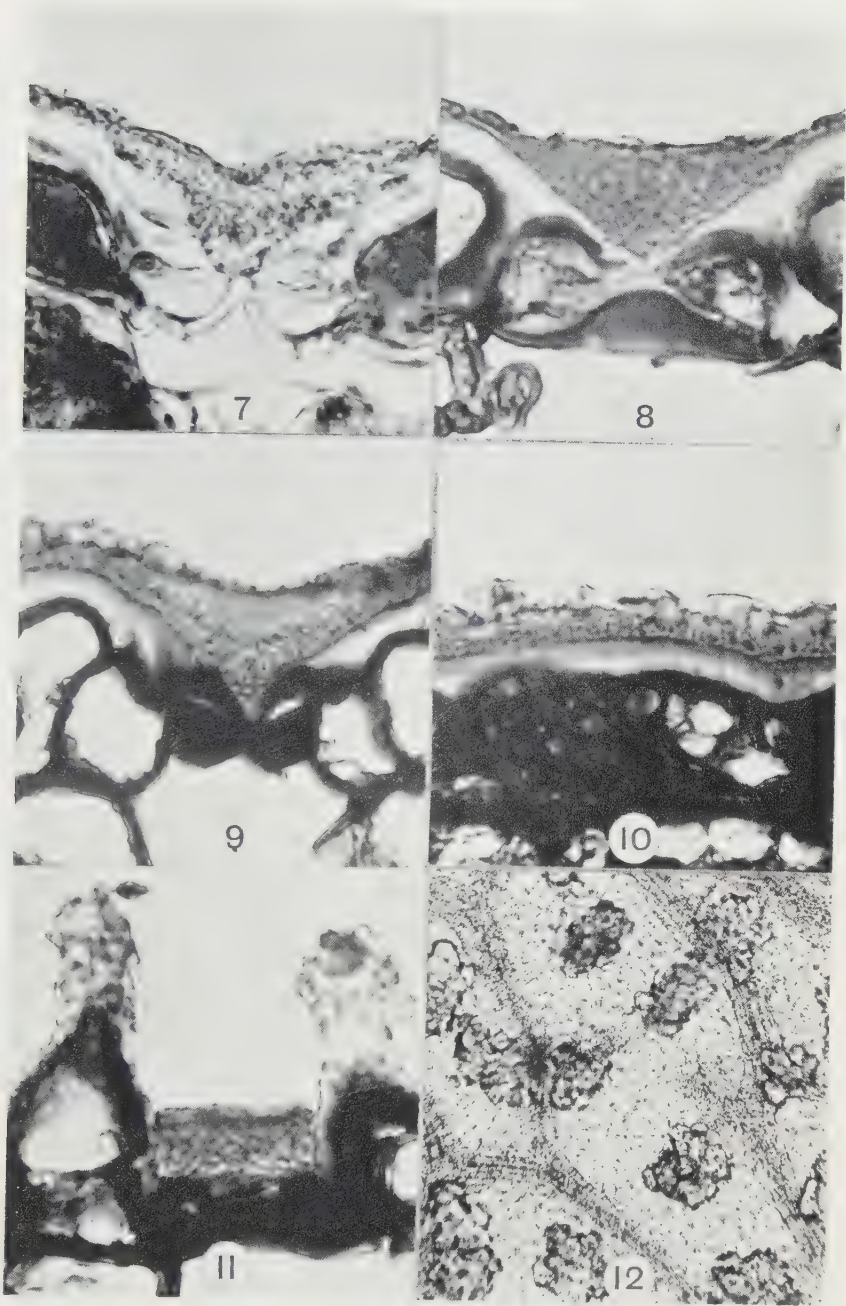
FIG. 13. *Drimys granadensis* var. *grandiflora* Hieron., *Cuatrecasas* 6687. FIG. 14. *Drimys rubiginosa* A. C. Sm., *Brass* 12629. FIG. 15. *Drimys granadensis* var. *grandiflora*, *Balls* 5749. FIG. 16. *Bubbia longifolia* A. C. Sm., *Brass* 13868. FIG. 17. *Bubbia Whiteana* A. C. Sm., *Brass* 2278. FIG. 18. *Drimys macrantha* A. C. Sm., *Brass* 4519.

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HARVARD UNIVERSITY.



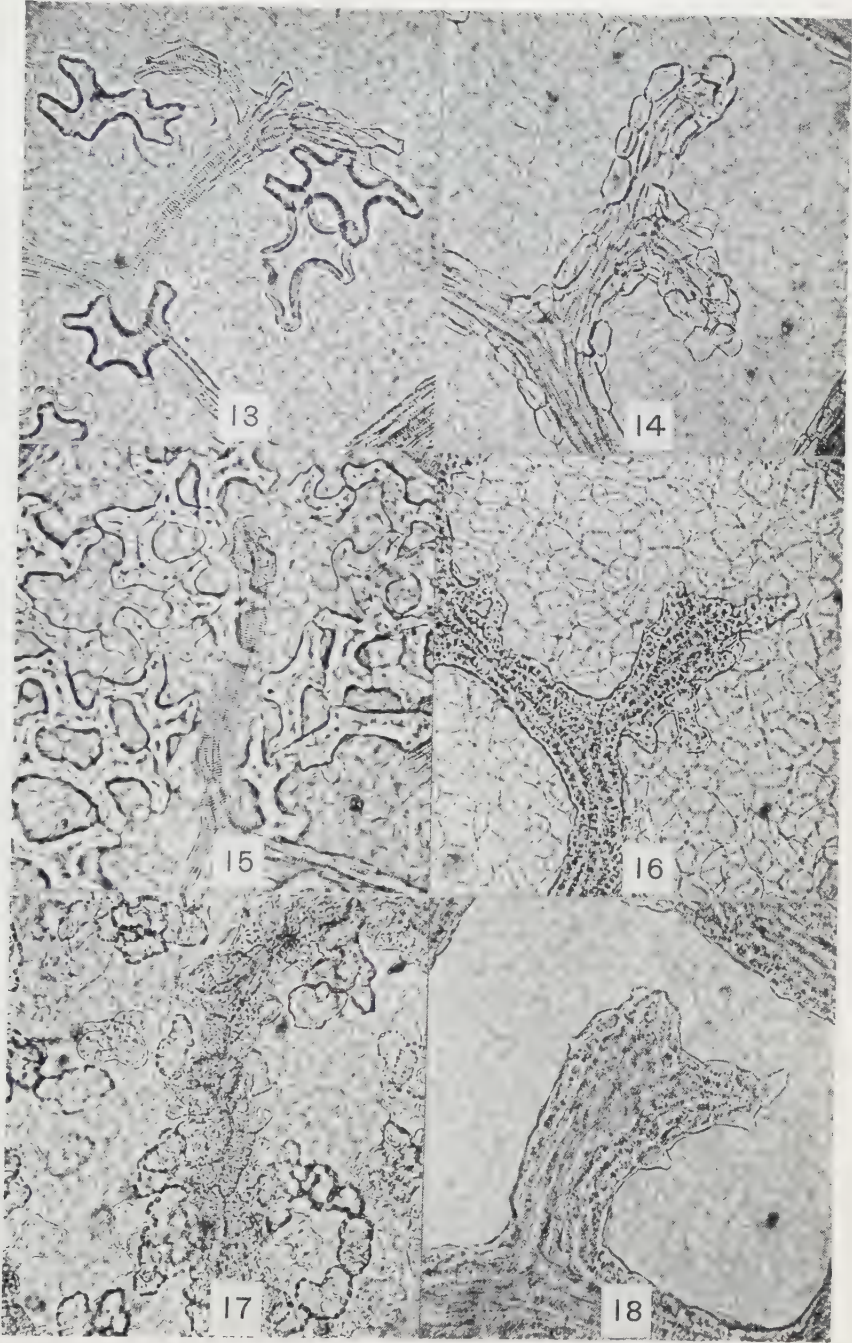
COMPARATIVE MORPHOLOGY OF THE WINTERACEAE





COMPARATIVE MORPHOLOGY OF THE WINTERACEAE





COMPARATIVE MORPHOLOGY OF THE WINTERACEAE



REVISION DEL GENERO ONOSERIS

RAMÓN FERREYRA*

Con nueve láminas

INTRODUCCION

EL GÉNERO *Onoseris* es uno de los miembros de la tribu Mutisieae, de las Compuestas. Comprende plantas que viven en Méjico, Centro América, y principalmente en la Cordillera Occidental de los Andes del Ecuador y Perú. Son de aspecto atractivo particularmente por sus flores que son moradas y amarillas. Algunas especies son anuales y endémicas de las "formaciones de loma" propias de la costa peruana, que se caracteriza por intermitentes precipitaciones denominadas "garúas", las que se inician en Junio y duran hasta Septiembre. Dentro de este grupo llama la atención por la hermosura de sus capítulos y flores la especie *O. odorata*.

Es de presumir que algunas especies se podrían domesticar como plantas de adorno dada la belleza de sus flores.

HISTORIA

Las primeras especies del género *Onoseris* fueron publicadas por Linneo hijo, Suppl. Pl. 349, 350 (1781), bajo los nombres de "*Atractylis purpurea*" y "*Atractylis Mexicana*". Afortunadamente estas especies se pudieron identificar con exactitud, por las ilustraciones que Smith, Ic. ined. 65, t. 65, hizo del material de Linneo.

El género *Onoseris* fué establecido por Willdenow, Sp. Pl. 3³: 1702 (1804), incluyendo las 2 especies de Linneo bajo los nombres de *O. purpurata* Willd. y *O. mexicana* Willd. Este concepto de Willdenow fué por lo tanto artificial. Las 2 especies pertenecen á distintos géneros de las Mutisieae, Compuestas.

El primero que reconoció ese artificio fué de Candolle, Ann. Mus. Paris 19: 65 (1812), quien dió una descripción original del género y agregó un concepto muy importante al decir: "Huc *Onoseris purpurata* Wild. Altera species est dubia." Posteriormente Cassini, Dict. Sci. Nat. 33: 463, 475 (1824), no aceptó el concepto artificial y separó las 2 especies de Willdenow, tomando *O. mexicana* para describir el nuevo género *Lycoseris*. Excepto Kuntze, Rev. Gen. 1: 354 (1891), los botánicos siguieron á Cassini considerando *O. purpurata* como Tipo de *Onoseris*.

En 1807 Willdenow, Mag. Ges. Naturk. Fr. Berlin 1: 139 (1807), publicó el género *Seris*, basándose en un espécimen de Colombia recibido de Humboldt y descrito brevemente como sigue: "I. SERIS Calyx imbri-

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catus patulus Corollae tubulosae Pappus pilosus sessilis. Receptaculum nudum. Gehört zur *Syngenesia aequalis* und hat mit *Cacalia* und *Stachelina* Aehnlichkeit." Esta planta que más tarde se describió como *Isotypus onoseroides* H. B. K. (1820) es ahora conocida con el nombre de *Onoseris onoseroides* (H. B. K.) Robinson. Otto Kuntze, Rev. Gen. 1: 364 (1891), declara que Willdenow publicó el binomio "*Seris onoserodes*", pero en realidad este binomio parece haber sido publicado primero por Sprengel, Syst. Veg. 3: 426 (1826). El género *Seris* Willd. no se usó mucho y en la literatura está dado en su mayor parte como sinónimo de *Isotypus* ó insuficientemente descrito. Lessing, Linnaea 5: 253 (1830), descartó completamente *Seris* Willd. y usó el nombre genérico para otro género (*Richterago* Kuntze) de Compuestas.

En 1891, Kuntze sostiene que el nombre *Onoseris* pertenece con la segunda especie de *Onoseris* de Willdenow al género usualmente llamado *Lycoseris* Cass. El mismo autor Kuntze usó *Seris* Willd. como el correcto nombre genérico para las plantas tratadas en la presente monografía. También sostuvo que Willdenow consideró *O. mexicana* como típica de su género, apoyándose en las siguientes razones. Primera, el herbario de Willdenow contenía un espécimen (posteriormente descrita como *Lycoseris denticulata* Less.) guardado en la cubierta de *Onoseris*. Segunda, Willdenow al publicar *Seris*, dió un nombre genérico para *Onoseris purpurata*, dejando el nombre de *Onoseris* para *O. mexicana*. El asunto de que Willdenow, después de describir su género *Onoseris*, recibió un ejemplar de *Lycoseris* y lo depositó en su herbario como una especie de *Onoseris* es interesante pero no importante. Aunque Willdenow publicó *Seris*, él desconoció la estrecha relación de *Seris* con respecto de su primer género *Onoseris* y por eso no pudo dar ninguna opinión acerca de cuál de las 2 especies debería ser el Tipo de ese género.

Con excepción de Kuntze, de todos los autores comenzando con de Candolle en 1812, cada uno excluyó *O. mexicana* de *Onoseris* ó la consideró como un miembro dudoso de este género. El primer botánico (Cassini, 1830) que dividió *Onoseris* conservó *O. purpurata* en dicho género y colocó la segunda especie de Willdenow, *O. mexicana*, en el nuevo género descrito *Lycoseris*. Es costumbre permitir á la primera persona que segrega un género artificial seleccionar cuáles de los miembros deberían conservarse en el género limitado. Desde que Willdenow no dió ninguna prueba evidente para saber cuál de sus 2 especies era la más típica de *Onoseris* parece razonable seguir á Cassini y á la gran mayoría de botánicos continuadores, los cuales tipifican el género por *Onoseris purpurata* Willd.

El género *Isotypus* H. B. K., Nov. Gen. et Sp. 4: 12. t. 307, con una sóla especie *I. onoseroides* H. B. K., fué publicado en 1820. Aunque fué antedatado por *Seris* Willd. (1807) y aparentemente basado en duplicados de la misma colección de Humboldt, lo aceptaron los botánicos (y *Seris* citada como un sinónimo) hasta que Bentham & Hooker, Gen. Pl. 2: 487 (1873), lo consideraron como una Sección de *Onoseris*. Los botánicos posteriores á Bentham & Hooker consideraron *Isotypus* simplemente como un grupo bien marcado de especies de *Onoseris*.

El género *Hipposcris* Cass., Dict. Sci. Nat. 33: 464 (1824), fué publicado para incluir *Onoseris* "*Salicifolia*" [*salicifolia*] H. B. K. y *O. acerifolia* H. B. K. Cassini no hizo la combinación *Hipposcris salicifolia* é *Hipposcris acerifolia*. Estos nombres aunque atribuidos á él fueron primero publicados en el Index Kewensis, 2: 1164 (1893).

En 1829, D. Don, Trans. Linn. Soc. 16: 254 (1829), funda el género *Centroclinium* de material del herbario de Ruiz y Pavón encontrado "In Peruvia". Solamente cita una especie *C. albicans*. Sin embargo, Don al referirse á *Onoseris salicifolia* dice: "may possibly belong to this genus". D. Don describe en el mismo tomo un nuevo género *Chaetachlaena*, fundándose también en el material del herbario de Ruiz & Pavón y Tafalla. Aunque este último, posiblemente por error, indica la localidad: "In Guayaquila Peruvianorum", la única especie de este género citada por Don "*C. odorata*", y que en el presente trabajo se llama *Onoseris odorata*, sólo es endémica de la vertiente occidental de los Andes del centro y sur del Perú. También Don está de acuerdo que *Centroclinium* tiene estrecha relación con este nuevo género porque dice: "*Chaetachlaena* is intimately allied to the preceding genus: the structure of the florets and pappus proves this most satisfactorily;".

De Candolle publicó en Prodrornus 7¹: 33 (1838) el nombre genérico *Hilairia* como sinónimo de *Isotypus* H. B. K.

Tres años más tarde Bentharn, Pl. Hartw. 88 (1841), describe el género *Caloseris* con una sólo especie, *C. rupestris*, encontrada por Hartweg en Guatemala. Este nombre es sinónimo de *Onoseris onoseroides* (H. B. K.) Robinson.

Spach, Hist. Nat. Veg. 10: 35 (1841), considera el género *Cladoseris*, basándose sólo en *Onoseris* Sección *Cladoseris* Lessing, Linnaea 5: 341 (1830), donde figura la descripción de una especie, *O. annua* Less., procedente del Perú. No se ha podido encontrar ningún binomio bajo este género.

Nuttall, Trans. Am. Philos. Soc. n. s. 7: 422 (1841), estableció el género *Cursonia* describiendo una especie, *C. peruviana*, que probablemente pertenece á *Onoseris odorata*.

Klotzsch, Allg. Gartenz. 17: 82 (1849), hizo la descripción de un nuevo género, *Schaetzellia*, con una sólo especie, *S. Deckeri* Kl. Fué descrita de material cultivado de semillas enviadas de Colombia. Este nombre es sinónimo de *Onoseris onoseroides* (H. B. K.) Robinson.

Dos años después Turczaninow, Bull. Soc. Nat. Moscou 24²: 94. t. 2 (1851), funda el género *Rhodoseris* y la especie *R. conspicua* de material colectado por Jurgensen en Méjico. El nombre *R. conspicua* es sinónimo de *Onoseris onoseroides* (H. B. K.) Robinson.

Posteriormente Koch & Fintelmann, Wochenschrift Gärt. u. Pflanzenkunde 2: 163 (1859), menciona, sin hacer descripción, el género *Cataleuca* y la especie *C. rubicunda*. Esta especie no figura en el Index Kewensis y se la cultivó en Bélgica bajo el nombre de *C. rubicunda*. En esta monografía recibe el nombre de *Onoseris onoseroides* (H. B. K.) Robinson. Por último Coulter, Bot. Gaz. 20: 52. t. 6 (1895), describe el género *Pereziopsis*, basado de un material colectado por Heyde & Lux en Guatemala

y cita *P. Donnell-Smithii*, que es sinónimo de *Onoseris Donnell-Smithii* (Coul.) Ferreyra.

MORFOLOGIA

RAÍZ. Casi todo el material estudiado carece de raíz completa y por eso me veo en la imposibilidad de hacer un estudio detallado de su morfología. Existen 6 especies de raíz anual más ó menos pivotante y el resto de raíz perennial.

TALLO. Los tallos son por lo general costados, excepción de *O. acerifolia*, que es terete. Algunas especies, entre ellas *O. hastata*, *O. alata*, y *O. sagittata*, se caracterizan por tener un tallo subterráneo distinto al rizoma, el cual origina ramas que crecen en el subsuelo y de las que se desprenden el escapo ó las hojas, que siempre son de posición semi-arrosetada. En *O. speciosa*, la base del tallo es diferente de las anteriores, se distingue por ser más corta y contraída como la forma de un caudex, además está cubierta de un tomento bruno y copioso. Otras especies arbustivas, como *O. onoseroides*, *O. silvatica*, y *O. costaricensis*, poseen un tallo vertical bien desarrollado. Con excepción de *O. acerifolia*, que tiene tallo leñoso y cubierto de pelos glandulosos, todas las demás especies tienen tallo poco consistente y blanco ó gris-lanuginoso.

HOJAS. Son alternas y de distribución esparcida ó más ó menos arrosetada. El limbo es muy variado no solamente por su forma sino también por sus dimensiones. En *O. onoseroides* y *O. Donnell-Smithii* las hojas son muy desarrolladas, el limbo es cordiforme y alcanza hasta 280 mm. de largo por 320 mm. de ancho; no sucede lo mismo con *O. hyssopifolia* de hojas pequeñas cuyo limbo lineal puede tener hasta 45 mm. de largo por 3 mm. de ancho. El limbo puede ser también asaetado ó poco más ó menos truncado en la base, como en *O. Castelnaeana*, *O. hastata*, *O. alata*, y *O. sagittata*. La forma predominante es lanceolada (10 especies). El margen generalmente es dentado y extendido ó muy poco revoluto. La forma y el tamaño de los dientes son variables, siendo ellos en las especies arbustivas más grandes, numerosos, y desiguales contrariamente á *O. Drakeana* y *O. salicifolia* cuyos dientes son pequeños y escasos. Únicamente *O. hyssopifolia* tiene margen entero y muy revoluto; otro caso particular es *O. acerifolia* cuyo margen presenta lóbulos angulosos é irregulares.

La disposición de las nervaduras puede ser palminerviada ó penninerviada. Todas las especies de Centro América y algunas de Sudamérica son palminerviadas, la base siempre posee 5 nervios palmados, solamente *O. acerifolia* tiene 7 á 8 nervios, también palmados. Las especies anuales y las sufruticasas *O. albicans*, *O. salicifolia*, *O. Weberbaueri*, y *O. gnaphalioides* son penninerviadas.

El haz es más ó menos araneoso y luego glabrescente, el envés gris-lanuginoso. Sin embargo *O. salicifolia* tiene el envés blanco-lanuginoso y su limbo membranáceo es de menor espesor que el de cualquier otra especie.

Las hojas usualmente son pecioladas, siendo sésiles en *O. minima*, *O. hyssopifolia*, *O. gnaphalioides*, y *O. Weberbaueri*. El pecíolo es terete en una especie, *O. acerifolia*, alado sin lóbulos en *O. hastata* y *O. Drakeana*,

y finalmente alado y con lóbulos en *O. onoseroides*, *O. costaricensis*, *O. Donnell-Smithii*, *O. silvatica*, *O. peruviana*, *O. fraterna*, *O. speciosa*, *O. purpurea*, y *O. sagittata*. El número de los lóbulos varía siendo en *O. silvatica*, variedad colombiana, de 11 pares y en *O. fraterna* de 9 pares; por el contrario *O. sagittata* lo tiene de 1-3 pares. El margen de los lóbulos puede ser muy dentado (*O. Donnell-Smithii*) ó entero (*O. sagittata*).

PUBESCENCIA. Hablando de una manera general, los pelos son largos ó cortos, rígidos ó más ó menos laxos. Solamente *O. acerifolia* se distingue por sus pelos que son hirsutos, numerosos, y terminan en una glándula que después se hace bruna. También *O. Donnell-Smithii* se caracteriza por tener pelos glandulosos, purpurascetes, los cuales se pueden encontrar en el eje de la inflorescencia. Algunas especies presentan una pubescencia muy compacta, suave, y más ó menos araneosa como sucede por ejemplo con *O. peruviana* y *O. silvatica*, mientras que otras la tienen mucho menos compacta; entre éstas últimas se pueden citar *O. Weberbaueri* y *O. hyssopifolia*.

INFLORESCENCIA. Todas las especies anuales y las sufruticosas *O. albicans*, *O. acerifolia*, *O. Weberbaueri*, *O. salicifolia*, *O. hyssopifolia*, y *O. gnaphalioides* se caracterizan por tener capítulos solitarios y terminales, ya sea en las ramas ó en el ápice del tallo. Las especies arbustivas poseen numerosos capítulos, dispuestos en panícula, pudiendo ésta alcanzar un gran desarrollo como *O. onoseroides*, que tiene hasta 300 capítulos aproximadamente. Otras especies sudamericanas pueden tener una inflorescencia muy poco ramificada, es decir de 2-8 capítulos (*O. speciosa*, *O. purpurea*, *O. sagittata*, *O. alata*, *O. Drakeana*, y *O. Castelnacana*).

INVOLUCRO. Es acampanado pero en *O. Donnell-Smithii* y *O. onoseroides* es visiblemente turbinado. Puede ser también hemisférico (*O. salicifolia* y *O. acerifolia*). Las brácteas involucrales son más ó menos lanceoladas. Existen 2 especies, *O. odorata* y *O. acerifolia*, que muestran peculiaridades en las brácteas del involucro; en ambas el ápice de las brácteas es largamente atenuado y muy flexuoso, además la segunda tiene el dorso de sus brácteas cubierto totalmente de pelos glandulosos. En *O. fraterna* el ápice es bruscamente agudo y *O. Castelnacana* muestra un ápice rígido y curvado hacia fuera. La mayor parte de las especies tienen el dorso de sus brácteas más ó menos araneoso. Sin embargo *O. Donnell-Smithii* presenta glándulas subuladas á lo largo del nervio medio, mientras que *O. onoseroides* tiene el dorso casi glabro. Las 2 últimas especies se distinguen también por el color rojizo de sus brácteas.

FLORES. De las 25 especies 3 (*O. onoseroides*, *O. Donnell-Smithii*, y *O. costaricensis*) son de capítulos homógamos, el resto heterógamos.

FLOR DEL DISCO. La corola tubulosa es siempre amarilla. El tubo por lo general es recto pero en *O. odorata* y *O. Cumingii* es geniculado y la rodilla rodeada de pequeños pelos. En *O. amplexicaulis*, *O. salicifolia*, y *O. hyssopifolia* el tubo es recto y adornado por pelos cortos de disposición anular y cerca de la parte media. Las siguientes especies, *O. albicans*, *O. gnaphalioides*, *O. fraterna*, *O. silvatica*, *O. peruviana*, *O. costaricensis*, son de tubo completamente glabro, las demás especies del género son más

ó menos pubescentes. El tubo puede ser cilíndrico ó ampliado en la parte superior; pertenecen al primer caso *O. albicans* y *O. fraterna* y al segundo *O. silvatica*, *O. peruviana*, y *O. Castelnaeana*. Las 3 especies homógamas y las heterógamas, *O. salicifolia* y *O. hyssoipifolia*, tienen la corola bilabiada con un lóbulo más grande que los 4 restantes iguales. También son bilabiadas *O. amplexicaulis*, *O. albicans*, *O. minima*, *O. odorata*, *O. Cumingii*, *O. gnaphalioides*, y *O. fraterna*, pero este grupo se diferencia del anterior porque tiene 2 lóbulos iguales y más grandes que los otros 3. Todas las corolas zigomorfas son siempre de lóbulos ascendentes.

Las especies de corola actinomorfa pueden dividirse en 2 grupos según sean sus lóbulos revolutos ó ascendentes. Son de lóbulos revolutos *O. Drakeana*, *O. Castelnaeana*, *O. alata*, *O. acerifolia*, y *O. Weberbaueri* mientras que *O. sagittata*, *O. peruviana*, *O. silvatica*, *O. hastata*, *O. purpurea*, y *O. speciosa* son de lóbulos ascendentes. La mayor parte de especies poseen pequeños pelos en el dorso de sus lóbulos.

Es interesante comprobar que las corolas zigomorfas y actinomorfas presentan formas de transición; tal sucede con *O. fraterna* cuyos lóbulos son ligeramente desiguales, luego con *O. hyssoipifolia* y *O. albicans* que muestran gradualmente mayor diferenciación. Los estambres son asaetados y la cola puntiaguda, sin embargo *O. albicans* y *O. amplexicaulis* tienen el ápice de la cola filiforme. Algunas especies poseen cola adornada por pelos cortos divaricados y únicamente *O. Donnell-Smithii* se diferencia por tener los pelos más grandes y ascendentes. El filamento es cilíndrico, siendo unas veces glabrescente como en *O. amplexicaulis* y *O. gnaphalioides* y otras veces finamente pubescente; entre estas últimas destaca *O. hastata* cuyos pelos son más grandes. El estigma es claviforme y más ó menos cilíndrico en *O. onoseroides* y *O. purpurea*. Las ramas son generalmente glabrescentes pero ciertas especies tienen el dorso ó el margen de las ramas cubierto de pelos muy cortos (*O. alata*, *O. salicifolia*, y *O. speciosa*).

FLOR MARGINAL. La corola es bilabiada y morado-violada. El tubo es aproximadamente cilíndrico y sólo en *O. peruviana* es contraído encima de la parte media. Más de la mitad de las especies tienen el tubo más ó menos pubescente. Son de tubo glabro *O. minima*, *O. odorata*, *O. amplexicaulis*, *O. Cumingii*, *O. albicans*, *O. gnaphalioides*, *O. fraterna*, y *O. peruviana*. El labio externo siempre es de mayor longitud que la del tubo, excepción de *O. fraterna* y *O. peruviana*, que son casi de la misma longitud. La mayoría de las especies son de labio externo lanceolado y con 6 nervios, solamente *O. acerifolia* presenta hasta 12. El ápice es tridentado, variando el tamaño de sus lóbulos; por ejemplo los lóbulos de *O. amplexicaulis* son muy desarrollados á diferencia de *O. Drakeana*, *O. purpurea*, y *O. fraterna* de lóbulos muy pequeños. El dorso es araneoso pero *O. hastata*, *O. Weberbaueri*, *O. speciosa*, y *O. acerifolia* presentan además pelos cortos y laxos. El labio interno es de 2 clases: entero y bipartido. Son de labio entero *O. fraterna*, *O. silvatica*, *O. purpurea*, *O. Drakeana*, *O. peruviana*, y *O. acerifolia*; las 3 primeras tienen el ápice muy poco retorcido al contrario de las 3 últimas que son de ápice espiralado y muy revuelto. Las demás especies poseen labio interno bipartido y con el ápice siempre atenuado.

La longitud del labio también es variable, en *O. hyssopifolia* es muy corto siendo en *O. Weberbaueri* y *O. speciosa* muy largo y retorcido en el ápice. Las especies *O. alata* y *O. amplexicaulis* se caracterizan de todas las demás, porque el seno situado entre los 2 lóbulos del labio interno es más profundo que los senos laterales.

AQUENIO. No maduro, es más ó menos cilíndrico y costado; algunas especies se distinguen por sus costillas de borde ancho y obtuso como *O. odorata*, *O. minima*, y *O. albicans*. Exceptuando *O. gnaphalioides*, *O. albicans*, y *O. Cumingii*, de aquenios glabrescentes, todas las demás especies son totalmente pubescentes y los pelos cortos, ascendentes, amarillos; sin embargo *O. alata* presenta pelos casi estrigosos.

PAPUS. Los pelos son siempre numerosos, amarillos, y cortamente barbelados. Es necesario indicar que algunas especies son de papus heteromorfo con los pelos internos de mayor longitud y grosor que los externos. Los pelos internos pueden ser más anchos y poco curvados cerca del ápice como en *O. salicifolia*, *O. albicans*, y *O. sagittata*, mientras que en otras especies pueden ser más anchos en la base y largamente atenuados y rectos hasta el ápice como en *O. amplexicaulis*, *O. odorata*, *O. Cumingii*, y *O. minima*. Se ha podido observar que en la flor hermafrodita los pelos del papus tienen mayor longitud que en la flor marginal; sin embargo *O. fraterna* se caracteriza porque los pelos del papus tienen igual longitud en ambas flores.

RELACIONES GENERICAS

Al intentar relacionar el género *Onoseris* con otros géneros, no ha sido posible hallar caracteres particulares con los cuales se pueda establecer una relación directa. El género *Onoseris* posee caracteres propios y distintos. Se ha colocado en Mutisieae-Gochnatinae porque sus flores son actinomorfas como en *O. Drakeana*, *O. Castelnacana*, *O. alata*, *O. acerifolia*, *O. Weberbaueri*, *O. sagittata*, *O. peruviana*, *O. silvatica*, *O. hastata*, *O. purpurea*, y *O. speciosa*. Las especies restantes presentan flores ligeramente zigomorfas y de acuerdo con la descripción dada en la llave, dichas especies deberían ser colocadas dentro del grupo Mutisieae-Mutisinae. Sin embargo no es posible hacerlo porque casi la mitad del total de especies son enteramente actinomorfas y las otras especies en su mayor parte tienen la corola tubulosa muy poco dividida de manera que sus flores no se pueden considerar estrictamente zigomorfas; además estas últimas se caracterizan porque sus lóbulos son siempre ascendentes y nunca revolutos. Algunos autores colocaron erróneamente ciertas especies del género *Trichocline* dentro de *Onoseris*. En *Trichocline* la flor tubulosa es bilabiada, siendo el labio externo liguliforme, extendido, ó revuelto y el labio interno generalmente más grande y sus 2 lóbulos siempre revolutos y divergentes. Tratándose de *Onoseris*, como ya se ha indicado arriba, los lóbulos de la flor considerada semibilabiada son siempre ascendentes. Por otra parte en *Trichocline* las ramas del estilo son muy cortas y más ó menos truncadas en el ápice (*T. hieracioides* (H. B. K.) Ferreyra: *T. caulescens* Phil.);

además las hojas son arrosetadas (excepto *T. nervosa* Less.). El género *Urmenetea* fué asimismo confundido con *Onoseris*; sin embargo tampoco existe relación directa porque la única especie del citado género, *U. atacamensis*, se caracteriza por tener hojas de envés muy reticulado, completamente distinto á *Onoseris*, aun más, la corola tubulosa es blanco-rosada (no amarilla); el tubo de la flor del disco, según se ha visto en la tábula, aparece con una ampliación ó ampolla más ó menos esférica cerca de la parte media; las ramas del estilo son muy cortas y obtusas (estilo no cilíndrico ni claviforme como en *Onoseris*) y finalmente el papus heteromorfo tiene 5 pelos subulados internos cuya longitud es aproximadamente 2 veces más que la longitud de los pelos externos que son más numerosos.

DISTRIBUCION

El área de distribución se extiende desde Méjico (*O. onoseroides*) hasta el norte de Argentina (*O. alata*), siguiendo la orientación de los Andes.

Las especies arbustivas tienen mayor concentración en Centro América y parte de la región más septentrional de Sudamérica; son endémicas de la selva. Las especies anuales son exclusivamente indígenas de la vertiente occidental de los Andes peruanos.

En el Perú habitan alrededor de 13 especies, de las que 9 son endémicas; en Centro América viven 4 y las otras especies tienen por habitat Colombia, Venezuela, Ecuador, Bolivia, y Argentina.

La planta de mayor distribución es *O. onoseroides*, la cual es posible encontrar en Méjico, Centro América, Colombia, y Venezuela; sigue *O. albicans* cuya dispersión geográfica comprende Ecuador, Perú, y Bolivia; á continuación sigue *O. gnaphalioides*, que se extiende desde el Noroeste del Perú hasta el Noroeste de Bolivia. Las otras especies tienen áreas mucho más reducidas, por ejemplo *O. hyssopifolia* que sólo habita en el Norte de Ecuador (Provincias de Imbabura y Pichincha).

MATERIAL EXAMINADO

Dejo constancia de mi agradecimiento á las personas encargadas de los herbarios, que á continuación se indican, por su gentileza al prestar el material necesario.

Los herbarios consultados y sus abreviaturas son los siguientes: Gray Herbarium of Harvard University (G); Field Museum of Natural History (FM); New York Botanical Garden (NY); United States National Herbarium (US); Department of Agriculture (National Arboretum) (DA).

Dado los inconvenientes actuales de la guerra no ha sido posible disponer de todos los Tipos, como hubiera sido mi deseo, pero pese á esa circunstancia se ha dispuesto de bastantes Tipos, fotografías, y material auténtico de la mayor parte de las especies y que al parecer son suficientes para hacer la identificación.

Las ilustraciones fueron ejecutadas por el autor, y en muchas de ellas, se simplificaron algunos detalles de poca importancia, con el exclusivo objeto de poder apreciar mejor los caracteres principales.

RECONOCIMIENTOS

La Estación Experimental Agrícola de La Molina acordó enviar un estudiante graduado á la Universidad de Harvard como pensionado del Gobierno peruano, con el fin de seguir estudios de Taxonomía. El Profesor Dr. Augusto Weberbauer, Técnico de La Molina, distinguido botánico cuyo nombre está asociado á numerosas plantas del Perú, á insinuación del ingeniero Bernardo Moravsky, entonces Superintendente; hizo la designación entre sus alumnos graduados de la Universidad Nacional Mayor de San Marcos. A mediados de 1942, el autor siendo Asistente de Botánica, fué elegido, obteniendo así la posibilidad de adquirir importantes conocimientos taxonómicos en una de las Universidades más prestigiosas de la Unión. Deseo expresar mi profundo agradecimiento al ilustre maestro Dr. Weberbauer, quien desde las aulas sanmarquinas supo despertar mi devoción por la Botánica y al ingeniero Bernardo Moravsky, actual Director de Agricultura, gran propulsor de todo lo relacionado con la agricultura nacional, por el honor y oportunidad que me han conferido.

En la Universidad de Harvard, el Profesor E. D. Merrill, Administrator of Botanical Collections, arregló el temporal nombramiento como Research Fellow at the Arnold Arboretum, concediéndome en esta forma todos los privilegios de un miembro de la Universidad. La mayor parte de los estudios fueron hechos en el Gray Herbarium, donde gracias á la bondad del Profesor M. L. Fernald, su Director, recibí todas las facilidades para el trabajo, el cual se hizo bajo la dirección del Dr. I. M. Johnston, quien sugirió *Onoseris* como un objeto de estudio y me concedió al mismo tiempo su ayuda y amistosa crítica á fin de llevar adelante la monografía. Durante la visita á Washington, D. C., el autor recibió la gentil ayuda del Sr. B. Y. Morrison, Dr. S. F. Blake, y Sr. E. P. Killip. A todos esos amigos y distinguidos botánicos en el Perú y Estados Unidos deseo expresar mi reconocimiento.

TRATAMIENTO SISTEMATICO

Onoseris Willdenow, Sp. Pl. 3³: 1702 (1804); H. B. K. Nov. Gen. et Sp. 4: 12. *t.* 307 (1807); de Candolle, Ann. Mus. Paris 19: 65. *t.* 12 (1812); Lagasca, Opúscula 41 (1816); Cassini, Dict. Sci. Nat. 33: 464 (1824); Lessing, Linnaea 5: 337 (1830); de Candolle, Prod. 7¹: 33 (1838); Bentham & Hooker, Gen. Pl. 2: 486 (1873); Hoffmann, in Engler & Prantl, Nat. Pfl. IV. 3: 338 (1893).

Capítulo heterógamo u homógamo, flores marginales femeninas dispuestas en una serie, flores del disco hermafroditas. Involucro acampanado, hemisférico ó turbinado; brácteas dispuestas en 4-12 series, imbricadas, lanceoladas, planas, ápice agudo, acuminado ó largamente atenuado, margen escarioso, las exteriores gradualmente menores. Receptáculo plano, convexo, fimbriífero, piloso ó desnudo. Corola femenina bilabiada, labio externo liguliforme, extendido, 6 nervios, raramente hasta 12, ápice tridentado, labio interno bilabiado ó entero; corola hermafrodita tubulosa, limbo usualmente cilíndrico ó ampliado, recto ó raramente geniculado, quinquefido, lóbulos iguales ó desiguales, rectos ó con ápice revuelto. Anteras de base sagitada, cola corta ó muy larga, desnuda ó con pelos divaricados, puntiaguda, raramente filífera. Estilo de la flor hermafrodita claviforme ó cilíndrico. Aquenio subterete, 5 costillas, raramente 4-6,

pubescente ó glabrescente. Papus setáceo, persistente, pelos en 2 ó más series, homomorfo ó raramente con pelos internos más largos y anchos, numerosos, cortamente barbelados más ó menos amarillentos. Herbácea, sufruticosa, perenne ó arbustiva. Hojas radicales ó alternas, igualmente dispuestas en el tallo ó más ó menos agrupadas en el extremo de las ramas, pecioladas, subsesiles, ó sésiles, limbo lanceolado hasta lineal, de aovado hasta sagitado y hastado, envés gris-lanuginoso, raramente blanco-lanuginoso. Capítulo solitario y terminal, inflorescencia panícula ó inflorescencia poco ramificada, pedúnculo corto ó muy largo, la parte superior adornada por brácteas subuladas, raramente sin brácteas. Corola purpúrea.

CLAVE PARA LA DETERMINACIÓN DE LAS ESPECIES

- Planta anual, herbácea, pequeña, habita en la vertiente occidental de los Andes del Perú.
 Brácteas involucrales con el ápice largamente atenuado filiforme y retorcido.....1. *O. odorata*.
- Brácteas involucrales con el ápice brevemente atenuado ó acuminado y no retorcido.
 Hojas de margen entero ó poco dentado, dientes pequeños, haz grisáceo; tubo de la flor hermafrodita geniculado, la rodilla adornada por pelos rígidos, amarillos y más ó menos cortos.
 Tallo erecto; pedúnculo de 2.5–9 mm. de largo; involucre á lo mayor de 12 mm. de altura.....2. *O. Cumingii*.
 Tallo decumbente con más capítulos; pedúnculo de 6–12 mm. de largo; involucre á lo mayor de 8 mm. de altura.....3. *O. longipedicellata*.
- Hojas de margen conspicuamente dentado, haz glabrescente verdoso; tubo de la flor hermafrodita recto con pelos más cortos cerca de la parte media externa.
 Base ancha amplexicaule en las hojas superiores, la parte media del limbo más angosta.....4. *O. amplexicaulis*.
 Base aguda en las hojas superiores, la parte media del limbo más ancha.
 Capítulo acampanado, ancho; ápice de las brácteas involucrales agudo ó escasamente acuminado; los 5 lóbulos de la flor tubulosa pubescentes en el dorso.....5. *O. annua*.
 Capítulo acampanado angosto con menos flores; ápice de las brácteas involucrales largamente acuminado; los 2 lóbulos mayores de la flor tubulosa poco pubescentes en el dorso.....6. *O. minima*.
- Planta perenne más ó menos sufruticosa.
 Pecíolo alado con margen lobuloso.
 Capítulo homógamo sin flores liguladas; brácteas del involucre angostas, usualmente menos de 2 mm.; papus amarillento; tubo de la corola semibilabiado, 1–4 lóbulos.
 Dorso de las brácteas involucrales pardo y araneoso; Costa Rica.....7. *O. costaricensis*.
 Dorso de las brácteas involucrales rojizo, glabrescente ó glabro.
 Tubo de la flor pubescente; el pedúnculo con pelos erectos más ó menos numerosos y glandulosos cerca del capítulo; dorso de las brácteas involucrales pubescente á lo largo de la costa, los pelos glandulosos.....8. *O. Donnell-Smithii*.
 Tubo de la flor glabro; pedúnculo y brácteas involucrales sin pelos glandulosos.....9. *O. onoseroides*.
- Capítulo heterógamo siempre con flores liguladas; brácteas del involucre anchas; papus amarillo-oscuro; tubo de la corola con 5 lóbulos iguales ó semibilabiado con 2–3 lóbulos.
 Brácteas involucrales con el ápice acuminado y el dorso tomentoso.
 Lóbulos de la flor hermafrodita iguales.
 Tubo de la flor marginal cilíndrico y mucho más corto que el labio externo; la longitud de los lóbulos de la flor del disco es siempre más de 2 veces

- su ancho; la panícula con más capítulos (18–21); margen de la hoja conspicuamente dentado, los dientes más agudos; la base del limbo con el par de nervios inferiores bien desarrollado; Costa Rica — Colombia10. *O. silvatica*.
- Tubo de la flor marginal contraído encima de la parte media, más ó menos igual á la longitud del labio externo; la longitud de los lóbulos de la flor del disco es siempre menos de $1\frac{1}{2}$ veces su ancho; la panícula con menos capítulos (7–9); margen de la hoja casi siempre muy poco dentado, los dientes pequeños; la base del limbo con el par de nervios inferiores poco desarrollado; Perú.....11. *O. peruviana*.
- Lóbulos de la flor hermafrodita desiguales; tubo de la flor del disco con la parte superior más ó menos del mismo ancho del de su base; las brácteas involucrales más anchas bajo el ápice y bruscamente agudas; Bolivia....12. *O. fraterna*.
- Brácteas involucrales con el ápice largamente atenuado y el dorso glabrescente. Hojas radicales; inflorescencia escapo; aquenio más ó menos glabrescente, los pelos muy cortos.....13. *O. speciosa*.
- Hojas caulinares colocadas encima de un tallo de unos decímetros de alto; inflorescencia más ó menos ramificada; aquenio totalmente pubescente, los pelos más grandes.
- Limbo hastado; peciolo con lóbulos dentados; brácteas del involucre con el ápice largamente atenuado; lóbulos de la flor tubulosa glabros en el dorso; tubo de la flor marginal ligeramente pubescente; Colombia....14. *O. purpurea*.
- Limbo asaetado; peciolo con lóbulos enteros; brácteas del involucre con el ápice brevemente atenuado; lóbulos de la flor tubulosa pubescentes en el dorso; tubo de la flor marginal densamente pubescente; Bolivia.....15. *O. sagittata*.
- Peciolo no alado ó alado pero sin lóbulos.
- Planta cubierta de pelos glandulosos; tallo terete; ápice de las brácteas involucrales muy atenuado y flexuoso, el dorso pubescente; haz de la hoja conspicuamente pubescente.....16. *O. acerifolia*.
- Planta sin pelos glandulosos; tallo anguloso; ápice de las brácteas involucrales agudo ó acuminado, el dorso glabrescente; haz de la hoja glabrescente.
- Base de la hoja ancha, limbo sagitado ó más ó menos ovoidado.
- Brácteas del involucre rígidas con el ápice curvado hacia fuera; base del limbo de la hoja truncada.....17. *O. Castelnaeana*.
- Brácteas del involucre con el ápice recto; base del limbo de la hoja sagitada ó raramente truncada.
- Limbo de la hoja de margen entero ó escasamente dentado, dientes pequeños; lóbulos de la flor tubulosa revolutos; flor marginal con el labio interno entero, espiralado, y muy retorcido.....18. *O. Drakeana*.
- Limbo de la hoja de margen conspicuamente dentado, dientes desiguales; lóbulos de la flor tubulosa ascendentes; flor marginal con el labio interno bipartido, recto ó poco retorcido.
- Inflorescencia escapo monocéfalo; brácteas del involucre anchas, 2–2.5 mm., de dorso araneoso purpurascense y de ápice acuminado.....19. *O. hastata*.
- Inflorescencia ramificada (2–8 capítulos); brácteas del involucre angostas, 1.4–2 mm., de dorso glabrescente grisáceo y ápice agudo. .20. *O. alata*.
- Base de la hoja aguda, limbo lanceolado ó lineal.
- Hojas escasas arrosetadas; flor del disco con sus lóbulos iguales y revolutos; flor marginal con el labio interno largamente atenuado y muy retorcido, y su tubo totalmente pubescente.....21. *O. Weberbaueri*.
- Hojas más ó menos numerosas, no arrosetadas; flor del disco con sus lóbulos desiguales y ascendentes; flor marginal con el labio interno brevemente atenuado y muy poco retorcido, su tubo glabro ó escasamente pubescente.

- Papus con pelos de 2 clases, los externos más cortos y más delgados; el ápice de las brácteas involucrales acuminado.
- Limbo de la hoja de poco espesor, haz más ó menos glabrescente-verdoso; nervaduras conspicuas, el margen escasamente revoluto.....22. *O. salicifolia*.
- Limbo de la hoja de mayor espesor, haz blanco-araneoso; nervaduras poco visibles, el margen mucho más revoluto.....23. *O. albicans*.
- Papus con una clase de pelos; el ápice de las brácteas involucrales agudo.
- Haz del limbo de la hoja poco araneoso; brácteas del involucre con pelos rígidos y cortos en su haz y cerca del ápice; tubo de la flor hermafrodita con un anillo de pelos cortos ascendentes cerca de la parte media y externa; lóbulos de la flor del disco glabros en el dorso; Ecuador...24. *O. hyssopifolia*.
- Haz del limbo de la hoja muy araneoso ó más ó menos tomentoso; brácteas del involucre sin pelos; tubo de la flor hermafrodita glabro, sus 2 lóbulos mayores con pelos cortos, escasos en el dorso; Perú y Bolivia.....25. *O. gnaphalioides*.

DESCRIPCIÓN DE LAS ESPECIES

1. *Onoseris odorata* (D. Don) Hook. & Arn. Comp. Bot. Mag. 1: 103 (1835).
Chaetachlaena odorata D. Don, Trans. Linn. Soc. 16: 257 (1829-33).
Leysera odorata R. et P. según D. Don, l.c. En sinónimo.
Cursonia peruviana Nutt. Trans. Am. Philos. Soc. n. s. 7: 422 (1841).
Seris odorata Kuntze, Rev. Gen. 1: 364 (1891).
Onoseris parva Muschler, Bot. Jahrb. 50: Beibl. 3: 95 (1913).
Onoseris integrifolia var. *filiphila* Cuatr. Anal. Univ. Madrid 42: 237 (1935).

Planta herbácea, anual, de 6-70 cm. de alto, más ó menos erecta, gris-lanuginosa, ramosa, ramas de 30-150 mm. de longitud. Hojas numerosas, cortamente pecioladas; limbo de 12-90 mm. de largo por 4-25 mm. de ancho, lanceolado, largamente atenuado en la base, el haz araneoso, luego glabrescente, envés gris-lanuginoso, penninerviado, el raquis prominente en el envés, ápice frecuentemente acuminado, raramente agudo, el margen desigualmente sinuoso-dentado, los dientes separados por trechos de 1.5-7 mm. Pecíolo de 2-4 mm. de largo, gris-lanuginoso. Capítulo solitario y terminal. Pedúnculo de 25-230 mm. de longitud, la parte superior adornada por brácteas de 3-7 mm. de largo, subuladas, escasas, laxas y de dorso araneoso, costado; costillas 14-16, de borde ancho, obtuso. Involucre de 8-15 mm. de altura por 5-8 mm. de diámetro, acampanado; brácteas dispuestas en 5-6 series, las interiores de 12-18 mm. de largo por 1.5-2 mm. de ancho, ápice largamente atenuado y muy flexuoso, el haz con pelos numerosos, cortos, rígidos, ascendentes, amarillos y dispuestos cerca del ápice, el margen poco escarioso, dorso araneoso y con pelos escasos, cortos, en la costa; las brácteas exteriores gradualmente menores. Receptáculo convexo y cubierto de páleas heteromorfas, amarillas y lacinosas. Flor del disco: corola de 7-11 mm. de longitud; tubo de 5-8.5 mm. de largo por 0.5-0.6 mm. de ancho en su base y 1.2-1.4 mm. en la parte superior, 5-nerviado, geniculado cerca de la parte media, la rodilla rodeada por pelos cortos, rígidos, ascendentes, amarillos y dispuestos en forma de anillo; limbo terminado en 5 lóbulos agudos, 3 lóbulos iguales, de 1.2-1.8 mm. de largo por 0.4-0.6 mm. de ancho en su base y 2 lóbulos de 2-2.5 mm. de largo por 0.6-0.8 mm. de ancho en su base, los 5 ascendentes con el dorso poco pubescente, raramente glabro. Anteras de 3-5 mm. de longitud, cola de 1.5-2 mm. de largo, puntiaguda, glabra; filamento de 2-3 mm. de

longitud, cilíndrico y finamente pubescente. Estilo claviforme; ramas anchas de 1.4–2 mm. de longitud. Aquenio de 2.2–4 mm. de largo por 0.7–1.2 mm. de ancho, con pelos escasos, cortos, amarillos, ascendentes, dispuestos cerca del papus, costado; costillas 5, de borde ancho, obtuso. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 8 mm. de longitud. Flor marginal: corola de 14–30 mm. de longitud; tubo de 2.5–4 mm. de largo por 0.6–0.8 mm. de ancho, glabro; labio externo de 11.5–26 mm. de largo por 2.5–5 mm. de ancho, 6-nerviado, dorso araneoso y con pelos escasos, cortos, ascendentes, el ápice tridentado, los 3 lóbulos más ó menos iguales, agudos, de 2–3 mm. de largo por 0.6–1.2 mm. de ancho en su base; labio interno bipartido, lóbulos de 1–2.4 mm. de largo, la base con pocos pelos cortos, el ápice atenuado y filiforme. Estilo conspicuamente claviforme, glabrescente; ramas de 2.2–3.2 mm. de longitud. Aquenio de 1.8–4 mm. de largo por 0.4–0.8 mm. de ancho, con pelos escasos, cortos, amarillos, ascendentes, dispuestos cerca del papus, costado; costillas 5, de borde ancho obtuso. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 6 mm. de longitud. LÁM. I, FIGS. 1–6.

DISTRIBUCIÓN: El área de distribución comprende la región occidental de los Andes peruanos, situada en los Departamentos de Lima y Arequipa, altura (100–)800–2500 metros.

PERÚ: Lima: Río Chillón, cerca Viscas, Junio 10–15, 1925, *Pennell 14479* (G, FM, US, NY), *Pennell 14468* (G, US, FM, NY), *Pennell 14454* (G, FM, US, NY); "Quive Department of Lima, June 9, 1925," *Pennell 14302* (G, FM, US, NY); Obrajillo, sin fecha, *Expedición Wilkes*, sin número (G, US); montañas cerca Chosica, Ferrocarril Lima-Oroya, Abril, 1910, *Weberbauer 5314* (G, FM, US); cerca Santa Eulalia, arriba de Chosica, Prov. Huarochirí, Abril 2, 1939, *Goodspeed 11303* (G, DA); Chosica, Marzo 11–13, 1923, *Macbride 2868* (FM, US); Camino Chosica-Matucana, Octubre 20, 1935, *Mexia 4088* (G, US); "Agua Verrugas", 1910, *Caec. et Ed. Seler 231* (US); "Purru-chuca", 1834–40, *Mathews 569* (ISOTIPO G); Arequipa: Mollendo, Noviembre 17, 1923, *Hitchcock 22361* (US); lomas al Este de Mollendo, Enero 24, 1937, *West 8240* (G, DA); lomas detrás del puerto de Mollendo, Octubre 16, 1925, *Johnston 3540* (G).

Esta planta se caracteriza por ser anual, pequeña, de tallo gris-lanuginoso y aproximadamente erecto; de flores hermafroditas amarillas y marginales violadas. Sin embargo uno de los caracteres más fácil de reconocer lo constituyen las brácteas involucrales, cuyo ápice es largamente atenuado y muy flexuoso.

La descripción de *Chaetachlaena odorata* D. Don es igual á esta especie; sin embargo el material encontrado en posesión del herbario de Lambert y colectado por Tafalla indica la localidad siguiente: "In Guayaquila Peruvianorum". Los especímenes examinados en esta monografía y pertenecientes á esta especie proceden de los Departamentos de Lima y Arequipa, por lo tanto es de presumir que la localidad citada por Tafalla debe ser probablemente errónea.

Es muy probable que *Cursonia peruviana* Nutt. es sinónimo de esta especie porque la descripción corresponde á la de *O. odorata*; por ejemplo al referirse á las brácteas involucrales dice: "linear-lanceolate, setosely acuminate and rather rigid"; además agrega que las hojas tienen el limbo dentado, el haz araneoso y el envés más ó menos blanco-tomentoso. También es sabido que la mayor parte de la colección de Curson procede de Arequipa.

La especie *Onoseris parva* Muschler fué fundada por Weberbauer 1492, procedente de las lomas cerca de Mollendo. He visto la fotografía del Tipo y la descripción original, y se puede deducir que no existen diferencias que puedan permitir separar *O. odorata* y *O. parva*. Además Domke, Notizbl. Bot. Gart. Berlin 13: 247 (1936), comparando el Tipo de *O. parva* y el Isotipo de *O. odorata*, perteneciente á Madrid, llega á la conclusión de que ambas son iguales.

José Cuatrecasas, Anal. Univ. Madrid 4^o: 237 (1935), estudiando los ejemplares de Pennell 14479 y 14468, de la localidad de Viscas, afirma que pertenecen á *Onoseris integrifolia* Less. variedad *filiphila*; no obstante se pueden identificar dichos ejemplares como pertenecientes á *O. odorata*, porque resaltan á primera vista los capítulos con sus brácteas involucrales largamente atenuadas y retorcidas en el ápice. Algunos ejemplares de Pennell, inclusive los anteriores, se distinguen por sus grandes dimensiones con relación á los demás, pero este mayor desarrollo se explica porque el año 1925, en que fueron colectados, se produjeron grandes precipitaciones en la vertiente occidental de los Andes peruanos.

2. *Onoseris Cumingii* Hook. & Arn. Comp. Bot. Mag. 1: 103 (1835).

Seris Cumingii Kuntze, Rev. Gen. 1: 364 (1891).

Planta herbácea, anual, erecta, gris-lanuginosa, de 12–29 cm. de alto, ramosa, ramas de 40–170 mm. de longitud. Hojas más ó menos numerosas, cortamente pecioladas, agrupadas en el ápice del tallo ó en el extremo de las ramas; limbo de 8–65 mm. de largo por 3–20 mm. de ancho, oblanceolado, haz araneoso, envés gris-lanuginoso, penninerviado, raquis prominente en el envés, el ápice agudo, margen brevemente sinuoso-dentado. Pecíolo de 2–4 mm. de longitud, gris-lanuginoso. Capítulo solitario y terminal. Pedúnculo de 22–120 mm. de longitud, gris-lanuginoso, costado; costillas 8–10, de borde ancho, obtuso; la parte superior adornada por brácteas de 2.5–5 mm. de largo por 0.2–0.3 mm. de ancho en su base, subuladas, escasas, de dorso araneoso. Involucro de 8–12 mm. de altura por 7–9 mm. de diámetro, acampanado; brácteas dispuestas en 5–6 series, las interiores de 8–10 mm. de largo por 0.8–1.4 mm. de ancho, ápice acuminado, su haz con pelos numerosos, cortos, rígidos, amarillos, ascendentes y dispuestos cerca del ápice, el dorso araneoso, margen poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo semiconvexo, cubierto de páleas heteromorfas, amarillas y laciniosas. Flor del disco: corola de 8–11 mm. de longitud; tubo de 6–8.4 mm. de largo por 0.4–0.5 mm. de ancho en su base y 0.8–1.2 mm. en la parte superior, 5-nerviado, geniculado cerca de la parte media, la rodilla rodeada de pelos cortos, rígidos, amarillos, ascendentes y dispuestos en forma de anillo; limbo terminado en 5 lóbulos agudos, 3 lóbulos iguales de 1–2 mm. de largo por 0.4–0.5 mm. de ancho en su base y 2 lóbulos de 2–2.6 mm. de largo por 0.6–0.7 mm. de ancho en su base, los 5 ascendentes, de dorso frecuentemente glabro ó raramente con pelos escasos, cortos. Anteras de 3.8–4.5 mm. de longitud, cola de 1.5–2 mm. de largo, puntiaguda, glabra; filamento de 2.5–4 mm. de largo, cilíndrico y finamente pubescente. Estilo claviforme; ramas anchas de 2–2.5 mm. de longitud. Aquenio de 2–3.5 mm. de largo por 0.6–1 mm. de ancho, más ó menos glabrescente ó provisto de pelos escasos, cortos, ascendentes, amarillos, dispuestos cerca del papus, costado; costillas 5, de borde ancho,

obtusos. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 6 mm. de longitud. Flor marginal: corola de 15–25 mm. de longitud; tubo de 2.5–4 mm. de largo por 0.4–0.6 mm. de ancho, glabro; labio externo de 12.5–21 mm. de largo por 2.5–3.5 mm. de ancho, 6-nerviado, dorso araneoso, el ápice tridentado, los 3 lóbulos agudos, más ó menos iguales, de 1–1.8 mm. de largo por 0.6–1 mm. de ancho en su base; labio interno bipartido, lóbulos de 1.5–3 mm. de longitud, glabros, el ápice atenuado y filiforme. Estilo claviforme, glabro; ramas de 2.5–4 mm. de longitud. Aquenio de 1.5–3 mm. de largo por 0.5–1 mm. de ancho, glabrescente ó provisto de pelos escasos, cortos, ascendentes, amarillos, dispuestos cerca del papus, costado; costillas 5, de borde ancho, obtuso. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 5 mm. de longitud. LÁM. I, FIGS. 7–12.

DISTRIBUCIÓN: Se ha encontrado solamente al Norte del Perú.

PERÚ: Piura: Cerro Pan de Azúcar, 5 millas al Noreste de la Brea, Junio 2, 1929, *Haught* 30 (G, FM, US, NY); Dept. ? : *Cuming* 995 (Fotografía TIPO FM).

Esta especie es muy afín a *O. odorata* de la que se diferencia principalmente por sus hojas de limbo oblanceolado y las brácteas involucrales de ápice acuminado no flexuoso. Además la localidad del Tipo se dice: "North Peru, Lima, etc., *Cuming* 995" y el material correspondiente á esta especie procede del Departamento de Piura situado al Norte del Perú; mientras que *O. odorata* es procedente de los Departamentos de Lima y Arequipa ó sea del Centro y Sur del Perú.

3. *Onoseris longipedicellata* Muschler, Bot. Jahrb. 50: Beibl. 3: 96 (1913).

Planta anual, de 35–40 cm. de alto, tallo erecto, gris-tomentoso, la base del tallo de 3–4 mm. de diámetro. Hojas opuestas (entrenudos de 3–4 cm. de longitud), brevemente pecioladas (pecíolo de 2.5–3 mm. de largo con el haz semiacanalado, densamente tomentoso-lanuginoso) ó subsesiles; limbo de 15–20 mm. de largo por 4.5–5 mm. de ancho, lanceolado ó aovado-lanceolado, haz densamente gris-lanuginoso, envés araneoso-lanuginoso, margen poco dentado. Capítulo solitario y terminal, largamente pedunculado. Pedúnculo de 60–120 mm. de largo, más ó menos terete, semicurvado ó erecto, densamente araneoso-lanuginoso, adornado por brácteas de 3–4.5 mm. de largo, subuladas ó filiformes. Involucro acampanado; brácteas dispuestas en 4–5 series, las interiores de 3–3.5 mm. de largo por 0.7–1 mm. de ancho, lineales ó raramente lineal-lanceoladas, dorso araneoso-tomentoso, ápice agudo ó acuminado; las brácteas exteriores gradualmente menores. Receptáculo plano y desnudo, de 3–3.5 mm. de diámetro. Flores del disco 25–30, tubulosas, hermafroditas; corola tubulosa-cilíndrica, glabra; limbo terminado en 5 lóbulos agudos. Antera sagitada. Estilo claviforme de 4–4.5 mm. de largo. Aquenio cubierto por pelos muy cortos y amarillentos. Papus plumoso y blanquecino-amarillento. Flores marginales 8–10, semibilabiadas; corola de tubo delgado, la parte inferior con pelos escasos, la parte superior glabra; limbo bilabiado, labio externo de 7–8 mm. de largo por 1–2.5 mm. de ancho, lineal-lanceolado, 6-nerviado, el ápice tridentado; labio interno brevemente bipartido. Estilo, papus y aquenio igual que en la flor hermafrodita.

DISTRIBUCIÓN: Ha sido encontrada en el Departamento de Lima, Perú.

PERÚ: Lima: San Bartolomé, estación vía férrea entre Lima y Oroya, altura 1700–1800 metros, *Weberbauer* 1698 (Fotografía TIPO FM).

Por falta de material no ha sido posible estudiar esta especie, de manera que sólo se ha reproducido la descripción original que se indica arriba. Se ha examinado la fotografía del Tipo, y en mi opinión parece que existen algunas discrepancias entre los caracteres que describe Muschler y dicha fotografía. De acuerdo con la descripción el tallo es erecto, las hojas opuestas, y las brácteas involucrales interiores de 3–3.5 mm. de longitud. Sin embargo la fotografía muestra con toda claridad que el tallo es decumbente, las hojas alternas ó más ó menos agrupadas y, de acuerdo con la escala, las brácteas involucrales interiores tienen 10–12 mm. de longitud.

4. *Onoseris amplexicaulis* sp. nov.

Planta herbacea annua ad 25 cm. alta e basi sparse et longe ramosa; foliis plus minusve numerosis pinnato-nervatis supra glabrescentibus subtus lanuginosis margine inaequaliter sinuato-dentatis, foliis inferioribus oblanceolatis infra medium basim versus gradatim attenuatis, foliis superioribus lanceolatis basi plus minusve amplexicaulibus; capitulis caulem et ramulos terminantibus; bracteis involucralibus 7–11 mm. longis apice acuminatis dorso araneosis plus minusve purpureis margine scariosis; floribus heteromorphis; floribus marginalibus 18–21 mm. longis, tubo ca. 3 mm. longo, labio exteriore 15–17 mm. longo ca. 4 mm. lato, labio interiore bilobato lobulis flagelliformibus; floribus disci ad 8 mm. longis bilabiatis, lobis tribus ad 1 mm. longis, lobis duobus ad 1.5 mm. longis; pappis heteromorphis setis interioribus ad 6 mm. longis quam exterioribus duplo longioribus et crassioribus.

Planta de 11–25 cm. de alto, erecta, tallo gris-lanuginoso, ramoso, ramas de 90–160 mm. de longitud. Hojas inferiores sésiles, las superiores amplexicaules; limbo de 14–75 mm. de largo por 3–20 mm. de ancho, oblanceolado ó lanceolado, los limbos mayores atenuados en la base, haz araneoso, luego glabrescente, envés gris-lanuginoso; penninerviado, raquis prominente en el envés, el ápice acuminado, raramente agudo, margen desigualmente sinuoso-dentado, los dientes separados por trechos de 3–9 mm. Capítulo solitario y terminal. Pedúnculo de 15–48 mm. de longitud, gris-lanuginoso, luego glabrescente, la parte superior adornada por brácteas de 3–5 mm. de longitud, subuladas, escasas, y de dorso araneoso, costado; las costillas de 8–10, de borde ancho, obtuso. Involucro de 7–11 mm. de altura por 5–6 mm. de diámetro, acampanado; brácteas dispuestas en 4–5 series, las interiores de 11–12 mm. de largo por 2–2.2 mm. de ancho, las brácteas exteriores gradualmente menores. Receptáculo convexo y cubierto de páleas heteromorfas, amarillas, y laciniosas. Flor del disco: corola de 7.8–8.5 mm. de longitud; tubo de 6.6–7 mm. de largo por 0.5–0.6 mm. de ancho en su base y 1–1.2 mm. en la parte superior, 5-nerviado, pubescente cerca de la parte media, los pelos cortos, rígidos, ascendentes, amarillos, y dispuestos en forma de anillo; limbo terminado en 5 lóbulos agudos, 3 lóbulos iguales de 0.8–1 mm. de largo por 0.4–0.5 mm. de ancho en su base y 2 lóbulos de 1.2–1.5 mm. de largo por 0.5–0.6 mm. de ancho en su base, los 5 ascendentes y de dorso poco pubescente, los pelos escasos, cortos. Anteras de 3–3.5 mm. de longitud, cola de 1.2–1.5 mm. de largo, glabra, el ápice filiforme; filamento de 2–2.2 mm. de largo, más ó menos cilíndrico, glabro. Estilo claviforme; ramas de 1.4–1.6 mm. de longitud, glabras. Aquenio de 2.5–4.2 mm. de largo por 0.8–1 mm. de ancho, pubescente, los

pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde ancho, obtuso. Papus con pelos numerosos, amarillos, los internos más grandes hasta 8 mm. de longitud. Flor marginal: corola de 18–21 mm. de longitud; tubo de 3–3.5 mm. de largo por 0.6–0.7 mm. de ancho, pubescente, los pelos escasos, cortos, ascendentes, amarillos; labio externo de 15–17.5 mm. de largo por 3.5–4 mm. de ancho, 6-nerviado, dorso araneoso, y con pelos escasos, cortos, ascendentes, amarillos, dispuestos en la parte inferior, el ápice tridentado, los 3 lóbulos agudos, más ó menos iguales, de 2.5–3 mm. de largo por 1.2–1.3 mm. de ancho en la base; labio interno bipartido, lóbulos de 2–2.5 mm. de largo, glabros, el ápice atenuado y filiforme, el seno situado entre los 2 lóbulos más profundo que los senos laterales. Estilo claviforme, glabro; ramas de 1.8–2 mm. de longitud. Aquenio de 2–4 mm. de largo por 0.8–1 mm. de ancho, pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde ancho, obtuso. Papus con pelos numerosos, amarillos, los internos más grandes hasta 6 mm. de longitud. LÁM. I, FIGS. 13–18.

DISTRIBUCIÓN: Habita en las inmediaciones de la ciudad de Matucana, altura 2400 metros, situada en el Departamento de Lima. Esta región se encuentra comprendida en la vertiente occidental de los Andes, casi al centro del territorio peruano.

PERÚ: Lima: Alrededores de Matucana, Julio 9, 1914, *Rose & Rose 18668* (US); Matucana, Abril 12 – Mayo 3, 1922, *Macbride & Featherstone 131* (FM, US), *Macbride & Featherstone 310* (TIPO Field Mus. 516844, Isotipo G).

Esta especie se acerca mucho á *Onoseris annua* Less., diferenciándose de ésta por tener las hojas superiores conspicuamente amplexicaules; el tallo más ramoso; las brácteas involucrales largamente atenuadas en el ápice y con el dorso más ó menos purpurascense; además el aquenio presenta costillas de borde ancho, obtuso, y fácilmente visible.

5. *Onoseris annua* Less. *Linnaea* 5: 341 (1830).

Planta herbácea, anual, de 12–16 cm. de alto, erecta, gris-lanuginosa, poco ramosa. Hojas escasas hasta 12, cortamente pecioladas; limbo de 10–25 mm. de largo por 5–10 mm. de ancho, lanceolado, largamente atenuado en la base, haz araneoso, luego glabrescente, envés gris-lanuginoso, penninerviado, el raquis prominente en el envés, el ápice agudo (raramente acuminado), margen desigualmente sinuoso-dentado, los dientes separados por trechos de 2–5 mm. Pecíolo de 1.5–2 mm. de longitud, gris-lanuginoso. Capítulo solitario y terminal. Pedúnculo de 10–70 mm. de longitud, gris-lanuginoso, luego glabrescente, costado, las costillas 8–10, de borde ancho, obtuso. Involucro de 9–10 mm. de altura por 5–7 mm. de diámetro, acampanado; brácteas dispuestas en 5–6 series, las interiores de 9–10 mm. de largo por 1.4–2 mm. de ancho, el ápice agudo, el haz con pelos cortos, rígidos, amarillos, ascendentes y dispuestos cerca del ápice, el dorso araneoso, el margen muy escarioso; las brácteas exteriores gradualmente menores. Receptáculo más ó menos plano cubierto de páleas heteromorfas, amarillas, y laciniosas. Flor del disco: corola de 7–7.5 mm. de longitud; tubo de 5.6–6 mm. de largo por 0.4–0.6 mm. de ancho en su base y 0.8–1 mm. en la parte superior, 5-nerviado, pubescente encima de la base, los pelos escasos, cortos, ascendentes y dispuestos en forma de anillo; limbo terminado en 5 lóbulos agudos, 3 lóbulos iguales de 0.8–1.2 mm. de largo por 0.3–0.4 mm. de ancho en su base y 2 lóbulos de 1.4–1.5 mm. de largo por 0.5–0.6 mm. de ancho en su base, los 5 ascendentes, y de dorso pubescente,

los pelos escasos, cortos, amarillos, y ascendentes. Anteras de 3.4–3.6 mm. de longitud, cola de 1.2–1.5 mm. de largo, puntiaguda, glabra; filamento de 1.6–1.8 mm. de longitud, cilíndrico, glabrescente. Estilo claviforme; ramas de 1–1.2 mm. de longitud. Aquenio de 2.2–3.5 mm. de largo por 0.5–0.9 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 6 mm. de longitud. Flor marginal: corola de 18–20 mm. de longitud; tubo de 3.5–4 mm. de largo por 0.5–0.6 mm. de ancho, pubescente en la parte superior, los pelos cortos, ascendentes, escasos, y amarillos; labio externo de 14.5–16 mm. de largo por 2.2–2.5 mm. de ancho, 6-nerviado, dorso araneoso, el ápice tridentado, los 3 lóbulos agudos, iguales, de 1.5–2 mm. de largo por 0.6–0.8 mm. de ancho en su base; labio interno bipartido, lóbulos de 2–2.2 mm. de largo, glabros, más ó menos filiformes. Estilo claviforme, glabrescente; ramas de 1.8–2 mm. de longitud. Aquenio de 2–2.2 mm. de largo por 0.5–0.6 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 5 mm. de longitud. LÁM. II, FIGS. 1–6.

DISTRIBUCIÓN: Ha sido encontrada solamente en el Departamento de Lima.

PERÚ: Lima: Sin localidad, sin fecha, *Dombey* (probablemente ISOTIPO FM); Indefinido (G); sin localidad, sin fecha, *Dombey* (Fotografía TIPO G).

Esta planta se caracteriza por ser de pequeñas dimensiones; el tallo es erecto y conspicuamente gris-lanuginoso; sus hojas escasas presentan un limbo sinuoso-dentado. El material típico fué colectado por Dombey: "In Chinchin"; esta región, de acuerdo con el relato de Hipólito Ruiz, Relación del Viaje, 26 (1931), se encuentra al Este de Huacho, Departamento de Lima, posiblemente en los alrededores de los actuales baños termales de Churín.

6. *Onoseris minima* Domke, Notizbl. Bot. Gart. Berlin 13: 247 (1936).

Planta herbácea, anual, de 10–14 cm. de altura, erecta, gris-lanuginosa, poco ramosa, ramas de 80–120 mm. de longitud, tallo costado, las costillas de 6–8, de borde ancho, obtuso. Hojas escasas, de 6 hasta 18, sésiles; limbo de 18–45 mm. de largo por 3–12 mm. de ancho, lanceolado, largamente atenuado en su base, haz araneoso, luego glabrescente, envés gris-lanuginoso, penninerviado, raquis prominente en el envés, el ápice frecuentemente acuminado, raramente agudo, margen brevemente sinuoso-dentado. Capítulo solitario y terminal. Pedúnculo de 5–35 mm. de longitud, gris-lanuginoso, costado; costillas 6–8, de borde ancho, obtuso. Involucro de 9–12 mm. de altura por 4–6 mm. de diámetro, más ó menos acampanado; brácteas dispuestas en 4–5 series, las interiores de 11–12 mm. de largo por 2–2.2 mm. de ancho, el ápice largamente atenuado, el dorso araneoso, el margen muy escarioso; las brácteas exteriores gradualmente menores. Receptáculo más ó menos convexo, cubierto de páleas heteromorfas, amarillas, y laciniosas. Flor del disco (8–10 flores): corola de 6–6.5 mm. de longitud; tubo de 5–5.2 mm. de largo por 0.6–0.7 mm. de ancho, 5-nerviado, pubescente, los pelos cortos, ascendentes, amarillos, dispuestos en forma de anillo y cerca de la parte media; limbo terminado en 5 lóbulos agudos, 3 lóbulos

iguales de 0.8–1 mm. de largo por 0.3–0.4 mm. de ancho en su base y 2 lóbulos de 1–1.2 mm. de largo por 0.4–0.5 mm. de ancho en su base, los 5 ascendentes, glabros ó raramente con pelos escasos, cortos en el dorso de los lóbulos mayores. Anteras de 2.2–2.4 mm. de longitud, cola de 0.8–1 mm. de largo, puntiaguda, glabra; filamento de 1.8–2 mm. de largo, cilíndrico y finalmente pubescente. Estilo claviforme, glabro; ramas de 1–1.2 mm. de longitud. Aquenio de 2.6–3 mm. de largo por 0.5–0.7 mm. de ancho, pubescente, los pelos cortos, ascendentes, amarillos, dispuestos en la parte superior, costado; costillas 5, de borde ancho, obtuso. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 6 mm. de longitud. Flor marginal (7–9 flores): corola de 10–11 mm. de longitud; tubo de 3.2–3.5 mm. de largo por 0.5–0.6 mm. de ancho, glabro; labio externo de 6.8–7.5 mm. de largo por 1.6–1.8 mm. de ancho, 6-nerviado, dorso araneoso, el ápice tridentato, los 3 lóbulos agudos, iguales, de 1.1–1.2 mm. de largo por 0.5–0.6 mm. de ancho en su base; labio interno bipartido, lóbulos de 1.5–2 mm. de longitud, pubescentes en el dorso, los pelos escasos, cortos, ascendentes, el ápice atenuado y más ó menos filiforme. Estilo claviforme, glabro; ramas de 1.8–2 mm. de longitud. Aquenio de 2.5–2.7 mm. de largo por 0.5–0.7 mm. de ancho, más ó menos pubescente, los pelos cortos, ascendentes, amarillos y dispuestos cerca del papus, costado; costillas 5, de borde ancho, obtuso. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 4.5 mm. de longitud. LÁM. II, FIGS. 7–12.

DISTRIBUCIÓN: Ha sido encontrada en el Departamento de Arequipa y en la Provincia Litoral de Moquegua, altura 1200–1900 metros.

PERÚ: Moquegua: Monte Estuquiña, Noroeste de Moquegua, Marzo 22, 1925, Weberbauer 7440 (G, FM, NY, US); Dept. ? : Entre el valle del Río de las Trancas y Llaxwa, Marzo, 1913, Hrdlicka (US).

Esta especie es muy afín á *Onoseris annua*, de la cual se diferencia por los capítulos más angostos (15–19 flores); las brácteas involucrales largamente atenuadas en el ápice y sin pelos en el haz; los 5 lóbulos de la flor del disco glabros ó raramente con pelos escasos en el dorso de los 2 lóbulos mayores; además las hojas tienen el margen del limbo muy poco dentado. El ejemplar Tipo procede de "Dep. Arequipa; Socosami, nordwestlich von Arequipa" (Srta. D. B. Stafford sin número) y el material limitado, de Moquegua, ambos situados al Sur del Perú; en cambio *O. annua* se encontró: "In Chinchin", que está en el Departamento de Lima.

7. *Onoseris costaricensis* sp. nov.

Planta robusta; foliis grandis, lamina 6–22 cm. longa 5–28 cm. lata cordiformi angulata palminervia, margine inaequaliter sinuoso-dentata, petiolo 4–28 cm. longo margine anguste alato et lobulato, lobulis 2–4-jugis majoribus 4–11 cm. longis; capitulis numerosis paniculatis, bracteis involucralibus multiseriatis dorso araneosis canescentibus; floribus homomorphis semibilabiatis 14–18 mm. longis, lobis inaequalibus 4 similibus 2.2–2.5 mm. longis, lobo exteriore 5–6 mm. longo; pappis ad 15 mm. longis plus minusve fuscis barbellatis.

Planta herbácea, perenne, de 100 cm. más ó menos de altura, erecta, gris-lanuginosa. Hojas de 14 hasta 16, casi agrupadas; limbo de 65–220 mm. de largo por 55–280 mm. de ancho, la base palminerviada con 5 nervios, haz primero araneoso y después glabrescente, envés gris-lanuginoso, ápice

agudo, raramente acuminado, margen desigualmente sinuoso-dentado, los dientes separados por trechos de 5–12 mm. Pecíolo de 45–280 mm. de longitud, lóbulos aovado-lanceolados, 2–4 pares opuestos ó raramente alternos, los mayores de 45–110 mm. de largo por 22–68 mm. de ancho gradualmente más grandes hacia el limbo. Inflorescencia panícula de 27–30 capítulos homógamos, cada uno con 10–12 flores hermafroditas. El eje de la panícula de 300–340 mm. de longitud cubierto totalmente por un indumento gris-lanuginoso y adornado por brácteas de 2–3 mm. de largo, escasas, subuladas, de dorso araneoso. Involucro, de 17–23 mm. de altura por 6–8 mm. de diámetro, acampanado; brácteas dispuestas en 6–7 series, las interiores de 15–21 mm. de largo por 1.2–1.8 mm. de ancho, de ápice acuminado, el dorso canescente-araneoso; las brácteas exteriores gradualmente menores. Receptáculo plano con páleas amarillas, heteromorfas, que rodean la base de cada flor. Flores homógamas: corola semibilabiada, de 14–18 mm. de longitud; tubo de 9–12 mm. de largo por 1–1.2 mm. de ancho, 5-nerviado, glabro; limbo terminado en 5 lóbulos, 4 lóbulos iguales, de 2.2–2.5 mm. de largo por 0.4–0.7 mm. de ancho en su base, el quinto de 5–6 mm. de longitud por 0.6–0.8 mm. de anchura y separado de los otros por senos mayores, los 5 agudos, rectos, el dorso con pelos escasos, cortos, ascendentes y cerca del ápice. Anteras de 7.5–8 mm. de longitud, cola de 3.5–4 mm. de largo, puntiaguda y provista de pelos muy cortos; filamento de 4–8 mm. de longitud, cilíndrico y finamente pubescente. Estilo más ó menos cilíndrico, glabrescente; ramas de 3.5–4 mm. de longitud. Aquenio de 3–7 mm. de largo por 1–1.2 mm. de ancho, totalmente pubescente, pelos ascendentes, amarillos, costado; costillas 5–6, de bordé más ó menos obtuso, cubiertas por el indumento. Papus con pelos numerosos, amarillos, los más grandes hasta 15 mm. de longitud. LÁM. II, FIGS. 13–18.

DISTRIBUCIÓN: Habita en Costa Rica, altura 500–900 metros.

COSTA RICA: San Ramón, Diciembre 27, 1928, *Brenes 6520* (TIPO, Field Mus. 854945); Santiago de San Ramón, camino de San Gerardo, Diciembre 8, 1928, *Brenes 6467* (G); "Taillis du Rodeo de Pacaca", Enero 1–2, 1891, *Pittier 3312* (G); El Brasil, Diciembre 26, 1927, *Valerio* (US); "Cabeceras del Bkis", Febrero, 1897, *Pittier 10596* (US).

Esta especie se relaciona estrechamente á *O. onoseroides* (H. B. K.) Robinson, pero se diferencia de ella fácilmente por sus brácteas involucrales que tienen el dorso conspicuamente gris-araneoso. Standley, en su obra "Flora of Costa Rica", página 1502, señala esta especie con el nombre de *Onoseris silvatica* Greenman, cuyos caracteres son enteramente distintos, siendo sus capítulos heterógamos, la flor tubulosa con sus 5 lóbulos iguales y sus brácteas involucrales más anchas y con pelos en el dorso de la costa. La etiqueta del ejemplar Tipo (*Brenes 6520*) señala una localidad casi ininteligible pudiéndose leer solamente San Ramón.

8. *Onoseris Donnell-Smithii* (Coul.) comb. nov.

Perezioopsis Donnell-Smithii Coul. Bot. Gaz. 20: 53. t. 6 (1895).

Planta robusta, perenne, de 50–300 cm. de altura, erecta, gris-lanuginosa. Hojas escasas, hasta 8, agrupadas en el extremo del tallo; limbo de 60–260 mm. de largo por 68–320 mm. de ancho, cordiforme, haz araneoso, luego glabrescente, envés gris-lanuginoso, palminerviado, la base con 5 nervios prominentes en el envés, el ápice más ó menos acuminado, el margen desigualmente sinuoso-dentado, los dientes separados por trechos de 2–12

mm. Pecíolo de 40–195 mm. de longitud, alado-lobulado, lóbulos casi sésiles, aovado-lanceolados, de 1–2 pares opuestos ó alternos, los mayores de 25–65 mm. de largo por 17–40 mm. de ancho, gradualmente más grandes hacia el limbo. Inflorescencia panícula, de 30–32 capítulos homógamos, cada uno con 10–11 flores hermafroditas. El eje de la panícula de 125–380 mm. de longitud, anguloso, cubierto de un indumento gris-lanuginoso y con pelos glandulosos, de 0.2–0.5 mm. de largo, erectos, purpurascents; adornado por brácteas, de 1.5–4 mm. de longitud, subuladas, purpurascents y más numerosas cerca del involucre. Involucre de 17–30 mm. de altura por 7–9 mm. de diámetro, turbinado; brácteas dispuestas en 7–8 series; las interiores de 23–24 mm. de largo por 1.4–1.8 mm. de ancho, ápice acuminado, margen escarioso, el dorso araneoso-rojizo y con pelos más ó menos glandulosos; las brácteas exteriores gradualmente menores. Receptáculo plano, con páleas heteromorfas, amarillas, que rodean la base de cada flor. Flores homógamas; corola de 20–21 mm. de longitud; tubo de 10.5–11 mm. de largo por 1.2–1.6 mm. de ancho, 5-nerviado, pubescente, los pelos numerosos, cortos, ascendentes; limbo terminado en 5 lóbulos, agudos, rectos, 4 lóbulos iguales, de 2–2.4 mm. de largo por 0.4–0.6 mm. de ancho en su base y el quinto de 9.5–10 mm. de largo por 0.6–0.9 mm. de ancho en su base, los 5 con el dorso pubescente, los pelos cortos, ascendentes, y amarillos. Anteras de 10.5–11 mm. de longitud, cola de 4.5–4.8 mm. de largo, puntiaguda, provista de pelos cortos, rígidos, ascendentes, más grandes los del lado interno; filamento de 7–10 mm. de largo, cilíndrico y finamente pubescente. Estilo cilíndrico, glabro; ramas de 4–5.5 mm. de longitud. Aquenio de 3.2–5 mm. de largo por 1.2–1.4 mm. de ancho, totalmente pubescente, los pelos ascendentes, amarillos, cortos, costado; costillas 5–6, de borde ancho, obtuso, amarillas. Papus con pelos numerosos, amarillos, los más grandes hasta 16 mm. de longitud. LÁM. III, FIGS. 1–6.

DISTRIBUCIÓN: Se conoce solamente al Sudeste de Guatemala y al Oeste del Salvador, altura 650–1450 metros.

GUATEMALA: Santa Rosa: Río de los Esclavos, Febrero, 1893, *Heyde & Lux 4527* (TIPO Univ. Chic. 264905; Isotipo G). EL SALVADOR: Ahuachapán: Sierra de Apaneca, región de Finca Colima, Enero 17–19, 1922, *Standley 20067* (G, US); Santa Ana: Alrededores de Santa Ana, Enero 8, 1922, *Standley 19701* (G, US, NY); Dept. ? : Cerro del Guayabal, Enero, 1924, *Calderón 2018* (G, US, FM, NY).

Esta especie es estrechamente afín á *Onoseris onoseroides* (H. B. K.) Robinson, de la cual se puede diferenciar por sus capítulos más grandes; el tubo de la flor es pubescente lo mismo que el dorso de sus lóbulos; finalmente el eje de la inflorescencia presenta numerosos pelos glandulosos, erectos, y más ó menos purpurascents, los cuales son más numerosos cerca del capítulo.

9. *Onoseris onoseroides* (H. B. K.) Robinson, Proc. Am. Acad. 49: 514 (1913).

Isotypus onoseroides H. B. K. Nov. Gen. et Sp. 4: 12. t. 307 (1820).

Seris onoseroides Willd. según Spreng. Syst. Veg. 3: 426 (1826).

Onoseris paniculata DC. Prodr. 7¹: 33 (1838). En sinónimo.

Hilairia paniculata DC. Prodr. 7¹: 33 (1838). En sinónimo.

Caloseris rupestris Benth. Pl. Hartw. 88 (1841).

Schaezzellia Deckeri Klotzsch, Allg. Gartenz. 17: 82 (1849).

Rhodoseris conspicua Turcz. Bull. Soc. Nat. Moscou 24²: 95. t. 2 (1851).

Catalaena rubicunda Hort. según Koch & Fintelmann, Wochenschr. Gärt. u. Pflanzenk. 2: 163 (1859).

Onoseris isotypus Benth. & Hook. f. Gen. Pl. 2: 487 (1873).

Seris conspicua Kuntze, Rev. Gen. 1: 364 (1891).

Seris rupestris Kuntze, Rev. Gen. 1: 364 (1891).

Onoseris paniculata Klatt, Bull. Soc. Bot. Belg. 31¹: 214 (1892).

Onoseris conspicua Greenm. Proc. Am. Acad. 41: 268 (1905).

Onoseris rupestris Greenm. Proc. Am. Acad. 41: 268 (1905).

Planta robusta, más ó menos arbustiva, perenne, de 75–400 cm. de alto, erecta, gris-lanuginosa. Hojas casi basales, escasas; limbo de 120–280 mm. de largo por 125–300 mm. de ancho, cordiforme, haz araneoso, luego glabrescente, envés gris-lanuginoso, palminerviado, la base con 5 nervios, prominentes en el envés, el ápice agudo, raramente acuminado, el margen desigualmente sinuoso-dentado, los dientes muy grandes, separados por trechos de 7–22 mm. Pecíolo de 22–480 mm. de longitud, alado y con lóbulos; lóbulos de lanceolados hasta aovados, raramente más ó menos cordiformes, de 2 hasta 6 pares, opuestos ó alternos, los lóbulos mayores de 25–120 mm. de largo por 11–116 mm. de ancho, gradualmente más grandes hacia el limbo (raras veces aparecen 2 pequeños lóbulos entre el limbo y los lóbulos superiores). Inflorescencia panícula con numerosos capítulos homógamos, cada uno provisto de 4–7 flores. El eje de la panícula de 140–450 mm. de longitud, anguloso (4–5 ángulos) cubierto de un indumento gris-lanuginoso y adornado por brácteas de 2–8 mm. de largo, subuladas, de dorso poco araneoso-purpurascense, y más numerosas cerca del involucre. Involucre de 9–23 mm. de altura por 4–9 mm. de diámetro, turbinado; brácteas dispuestas en 7–8 series, las interiores de 19–26 mm. de largo por 1.2–1.8 mm. de ancho, de ápice acuminado, el dorso glabrescente-rojizo, margen poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano con páleas heteromorfas, amarillas, laciniosas, que rodean la base de cada flor. Flores homógamas: corola de 15–25 mm. de longitud; tubo de 6–13 mm. de largo por 0.8–1.2 mm. de ancho en su base y 1.8–2 mm. en la parte superior, 5-nerviado, glabro; limbo terminado en 5 lóbulos agudos, ascendentes, 4 lóbulos iguales, de 1.6–4 mm. de largo por 0.4–0.6 mm. de ancho en su base y el quinto de 9–12 mm. de largo por 0.5–1.2 mm. de ancho en su base, los 5 ligeramente pubescentes en el dorso, raramente glabros, los pelos cortos, ascendentes, amarillos. Anteras de 9–12 mm. de longitud, cola de 3.6–4.5 mm. de largo, puntiaguda y provista de pelos cortos divaricados; filamento de 5–11 mm. de largo, cilíndrico y finamente pubescente. Estilo más ó menos cilíndrico, glabro; ramas de 3.6–5 mm. de longitud. Aquenio de 2–10 mm. de largo por 1.1–1.5 mm. de ancho, totalmente pubescente, los pelos ascendentes, amarillos, cortos, costado; costillas 4–5, de borde angosto, cubiertas por el indumento. Papus con pelos numerosos, amarillentos, los más grandes hasta 17 mm. de longitud. LÁM. III, FIGS. 7–11.

DISTRIBUCIÓN: Es de amplia distribución, ha sido encontrada al Sur de Méjico, Guatemala, Honduras Británica, Panamá, Colombia, y al Norte de Venezuela, altura 400–1800 metros.

MÉJICO: Jalisco: Hacienda del Ototal, San Sebastián, Sierra Madre, Marzo 10, 1927, *Mexia* 1858 (G, FM, NY, US); Sierra Madre, Enero 19, 1899, *Langlassé* 759 (G, US); Oaxaca: Plumia, Marzo 17, 1895, *Nelson* 2480 (G, US); alrededores de Cafetal, Concordia, Abril 1–15, 1933, *Morton & Makrinus* 2402 (FM, US); Cafetal, Soledad, Diciembre 27, 1917, *Reko* 3705 (US); entre Plan de Minas y Puchalengo, Distrito de Inquila, Diciembre 29, 1921, *Conzatti* 4546 (US); Chiapas: San Bartolomé, Marzo 21, 1904, *Goldman* 763 (US). GUATEMALA: Sololá: Cerca

San Lucas, Febrero 27, 1907, *Kellerman 6326* (FM); Chimaltenango: Chimaltenango, Diciembre 30, 1937, *J. R. Johnston 1150* (FM); Sacatepéquez: Barranco Hondo, Diciembre 16, 1938, *Standley 60263* (FM); cerca Barranco Hondo, al Sudeste de Alotenango, Febrero 9, 1939, *Standley 64963* (FM); Dept. ? : Sin localidad, sin fecha, *Pittier* (US); sin localidad, 1905, *Pittier* (US). HONDURAS BRITÁNICA: Distrito del Cayo, Marzo 16, 1938, *Gentle 2356* (NY, DA). PANAMÁ: Chiriquí: Entre Hato del Jobo y Cerro Vaca, al Este de Chiriquí, Diciembre 25-28, 1911, *Pittier 5412* (G, US); Calderas, Chiriquí Viejo, Marzo, 1938, *Bro. Maurice 850* (US). COLOMBIA: Magdalena: Santa Marta, 1898-1901, *H. Smith 676* (G, FM, US). VENEZUELA: Aragua: Faldas escarpadas de Rancho Grande, Aragua, Enero 11, 1939, *L. Williams 11066* (G, FM, US); Colonia Tovar, 1856-7, *Fendler 679* (G); Maracay, 1928, *Vogl 662* (G); Camino á Choroni, Marzo 2, 1941, *Chardon 276* (US); Carabobo: Alrededores de Valencia, Enero 5-17, 1920, *Pittier 8742* (G, US, NY).

Esta planta arbustiva llega á adquirir un gran desarrollo (más ó menos 4 metros de altura) y es quizás la más robusta de todas las del género. Se caracteriza también por su inflorescencia panícula, la cual puede contener hasta 300 capítulos homógamos, cada uno con 4-11 flores hermafroditas. El involucreo es turbinado y las brácteas involucrales de dorso araneoso y purpurascete. Habita en las regiones cálidas y muy húmedas. Por ejemplo, el material que sirvió de Tipo se dice: "Crescit regione calida in ripa fluvii Tuy, alt. 300 hex. (Prov. Venezuelae)". Por la descripción original y por la tábula fué fácil identificar los numerosos especímenes que aquí se limitan. Me parece importante anotar que la mayoría de los ejemplares presentan de 4-7 flores en cada capítulo mientras que los otros de 8-11 flores. Entre estos últimos podemos citar los procedentes de Guatemala, Honduras Británica, y Colombia. Conviene advertir también que algunos especímenes de Méjico exhiben en el pecíolo hasta 5 pares de lóbulos, opuestos ó alternos, siendo en el resto de menos pares, además los pelos del papus son de amarillo hasta amarillo-claro; sin embargo los caracteres más importantes son iguales.

Tanto *Onoseris paniculata* DC. como *Hilairia paniculata* DC. fueron publicadas en sinónimos bajo el nombre de *Isotypus onoseroides* H. B. K.

El espécimen que sirvió de Tipo para fundar *Caloseris rupestris* Benth. fué encontrado por Hartweg (599), "In rupibus prope montem Chorro, milias duodecim ab urbe Guatemala distantem"; su descripción original corresponde á los caracteres del material determinado. De semillas enviadas de Colombia por Karsten, se cultivó una planta en uno de los jardines de Alemania, que más tarde se describió con el nombre de *Schachtzella Deckeri*. Según Schultz, Flora 33: 419 (1850), dicho binomio es igual á *Isotypus onoseroides* H. B. K. Ambas descripciones así lo evidencian. Diez años más tarde se la cultivó en Bélgica, bajo el nombre de *Cataleuca rubicunda* Hort., cuyo género y especie nunca fueron descritos.

El botánico Turczaninow describió el género *Rhodoseris* y su especie *R. conspicua*, que fué fundada de material colectado por Jurgensen en "Sierra San Pedro, Nolasco", situado en Méjico. He visto dicha descripción lo mismo que su tábula, y ambas muestran los mismos caracteres de *Onoseris onoseroides*.

Desde el punto de vista taxonómico la especie *Onoseris isotypus* Benth.

& Hook. f. es igual á *Isotypus onoseroides* H. B. K. El nombre específico de *O. isotypus* fué obtenido por Benthams & Hooker del nombre genérico de *Isotypus onoseroides*.

En Bull. Soc. Belg. 31¹: 214 (1892) se cita sin descripción *Onoseris paniculata* Klatt como igual á "*Isotypus onoseroides* H. B. et K." y se indica como localidad de la primera: "Forêts de l'Alto del Rodeo, 1100 m. (n. 1622)"; sin embargo este ejemplar de Pittier no pertenece á *O. onoseroides*, sino á otra especie muy distinta, de capítulo heterógamo, denominada *Onoseris silvatica* Greenm.

10. *Onoseris silvatica* Greenm. Proc. Am. Acad. 40: 51 (1904).

Planta herbácea, perenne, de 48–200 cm. de altura, erecta, caulescente gris-lanuginosa. Hojas de 3 hasta 6, largamente pecioladas; limbo de 61–290 mm. de largo por 58–300 mm. de ancho, cordiforme, con orejas usualmente obtusas, el haz araneoso, luego glabrescente, el envés gris-lanuginoso, palminerviado, la base con 5 nervios, prominentes en el envés, el ápice acuminado, el margen desigualmente sinuoso-dentado, los dientes separados por trechos de 5–20 mm. Pecíolo de 45–310 mm. de longitud, alado y con lóbulos (raras veces las hojas mayores tienen pecíolo alado sin lóbulos) aovado-lanceolados, 7 pares, raramente 3–4 pares, opuestos ó alternos, los mayores de 14–55 mm. de largo por 9–36 mm. de ancho, gradualmente más grandes hacia el limbo. Inflorescencia panícula con 6–14 capítulos heterógamos. Eje de la panícula de 250–850 mm. de longitud, anguloso (4–5 ángulos), gris-lanuginoso, adornado por brácteas de 3–9 mm. de largo por 0.5–1 mm. de ancho en su base, subuladas, de dorso araneoso, escasas. Involucro de 15–24 mm. de altura por 9–14 mm. de diámetro, acampanado; brácteas dispuestas en 6–7 series, las interiores de 18–20 mm. de largo por 2.5–3.3 mm. de ancho, ápice acuminado, el dorso araneoso y con pelos escasos, cortos, ascendentes, dispuestos en la costa, el margen poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano, con páleas heteromorfas, amarillas y laciniosas. Flor del disco: corola de 17.2–21 mm. de longitud; tubo de 15–18.2 mm. de largo por 1–1.3 mm. de ancho en su base y 2.4–2.8 mm. en la parte superior, 5-nerviado, glabro; limbo terminado en 5 lóbulos agudos, iguales, de 2.2–2.8 mm. de largo por 1–1.2 mm. de ancho en su base, los 5 ascendentes y de dorso más ó menos pubescente, los pelos cortos, amarillos y dispuestos cerca del ápice. Anteras de 6–7 mm. de longitud, cola de 3.2–4 mm. de largo, puntiaguda, glabra; filamento de 7–9 mm. de largo, casi cilíndrico y finamente pubescente. Estilo más ó menos cilíndrico, glabro; ramas de 3–3.2 mm. de longitud. Aquenio de 3.2–6.5 mm. de largo por 1–1.5 mm. de ancho, totalmente pubescente, los pelos ascendentes, cortos, amarillos, costado; costillas 5–6, de borde angosto, cubiertas por el indumento. Pápus con pelos numerosos, amarillos, los más grandes hasta 18 mm. de longitud. Flor marginal: corola de 20.5–21 mm. de longitud; tubo de 7–8 mm. de largo por 0.6–0.7 mm. de ancho, glabro; labio externo de 12.5–13 mm. de largo por 2.2–2.8 mm. de ancho, 6-nerviado, raramente 4–7 nervios, dorso araneoso y con pelos cortos, escasos, ascendentes, el ápice tridentado, los 3 lóbulos agudos, más ó menos iguales, de 0.3–0.8 mm. de largo por 0.3–0.6 mm. de ancho en su base; labio interno entero de 9–11 mm. de longitud por 0.4–0.5 mm. de anchura en su base, glabro, largamente atenuado y retorcido en el ápice. Estilo más ó menos cilíndrico, glabro; ramas de

3.6–4.8 mm. de longitud. Aquenio de 3.5–6.5 mm. de largo por 0.9–1.4 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5–6, de borde angosto, cubiertas por el indumento. Pápus con pelos numerosos, amarillos, los más grandes hasta 16 mm. de longitud. LÁM. IV, FIGS. 1–6.

DISTRIBUCIÓN: Es indígena de Costa Rica.

COSTA RICA: "Forêts des collines de Nicoya, Jan., 1900", *Tonduz 13597* (G, US, FM); El Rodeo, sin fecha, *Lankester 1317* (FM); Tabarcia, Enero, 1938, altura 1000 metros, *Solis 533* (FM); "Forêts de l'Alto del Rodeo", Diciembre 28, 1889, altura 1100 metros, *Pittier 1622* (TIPO G).

Esta planta ha sido confundida con otras especies más robustas de Colombia como *O. onoscroides*, debido á que sus hojas eran más ó menos iguales. Sin embargo al examinar los capítulos se comprueba que los de *O. silvatica* son heterógamos y los de *O. onoseroides* son homógamos.

10a. *Onoseris silvatica* var. *colombiana* var. nov.

A varietate typica differt lobulis petioli numerosis ad 11, lobis florum disci glabris; costa bractearum involucralium glabra.

La variedad difiere de la típica principalmente por los siguientes caracteres: los capítulos son más angostos; el limbo de sus hojas es de mayor espesor y de indumento más compacto; el pecíolo de las hojas superiores posee hasta 11 lóbulos muy visibles; los 5 lóbulos de la corola de la flor hermafrodita son glabros en el dorso; la costa de las brácteas involucrales es glabra en el dorso; además la variedad procede de la región oriental de los Andes situada más ó menos al centro del territorio colombiano mientras que la típica sólo ha sido encontrada en Costa Rica. LÁM. IV, FIGS. 7–12.

COLOMBIA: El Meta: A lo largo del Río Guatiquía, cerca Villavicencio, Marzo 18–19, 1939, altura 500 metros, *Killip 34429* (TIPO U. S. Nat. Herb. 1771256).

11. *Onoseris peruviana* sp. nov.

Planta robustula 6–10 dm. alta annua vel biennis; foliis paucis amplis supra medium caulis simplicis erecti gestis, laminis 10–19 cm. longis hastatis 8–20 cm. latis margine minute denticulatis supra viridibus subtus dense araneosis, petiolo 8–19 cm. longo alato lobulato, lobulis 3–6-jugatis sursum majoribus; capitulis 7–9 in paniculis laxis longipedunculatis gestis, bracteis involucralibus dorso araneosis plus minusve glabrescentibus costa pilis rigidis adscendentibus glanduliferis ornata; floribus heteromorphis; floribus marginalibus ad 2 cm. longis, tubo supra medium angustiore, labio exteriori quam longitudine tubi breviori, labio interiori integerrimo 6–7 mm. longo supra medium contorto; floribus disci regularibus ad 17 mm. longis supra medium tubi ampliatis, lobulis longitudine quam latitudine paulo majoribus.

Planta herbácea, perenne, de 60–100 cm. de altura, erecta, caulescente, tallo canescente, más ó menos tomentoso. Hojas hasta 7, largamente pecioladas; limbo de 100–190 mm. de largo por 86–205 mm. de ancho, hastado, haz araneoso, envés gris-lanuginoso, palminerviado, la base con 5 nervios, el ápice acuminado, margen desigualmente sinuoso-dentado, los dientes pequeños y separados por trechos de 3–26 mm. Pecíolo de 85–195 mm. de longitud, alado y con lóbulos aovado-lanceolados, desde 3 hasta 6 pares, opuestos ó alternos, los lóbulos mayores de 48–58 mm. de largo por 18–28 mm. de ancho, gradualmente más grandes hacia el limbo. Inflorescencia panícula con 7–9 capítulos heterógamos y largamente pedunculados.

Pedúnculo de 400–460 mm. de largo, anguloso (3–4 ángulos), gris-lanuginoso, luego glabrescente, adornado por brácteas de 3–6 mm. de largo por 0.4–1 mm. de ancho en su base, subuladas, escasas, de dorso araneoso, y más numerosas cerca del involucre. Involucro de 14–20 mm. de altura por 7–10 mm. de diámetro, acampanado; brácteas dispuestas en 6–7 series, las interiores de 18–20 mm. de largo por 2.4–2.5 mm. de ancho, ápice acuminado, el dorso araneoso y con pelos cortos, escasos, ascendentes, dispuestos a lo largo de la costa, el margen escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano y cubierto de páleas heteromorfas, amarillas, y laciniosas. Flor del disco: corola de 16–17 mm. de longitud; tubo de 14.8–15.6 mm. de largo por 0.8–1 mm. de ancho en su base y 1.8–2 mm. en la parte superior, glabro, 5-nerviado; limbo terminado en 5 lóbulos de 1.2–1.4 mm. de largo por 0.8–1 mm. de ancho en su base, los 5 agudos, iguales, ascendentes, y glabros en el dorso. Anteras de 4.5–4.8 mm. de longitud, cola de 2–2.2 mm. de largo, puntiaguda, glabra; filamento de 5–5.5 mm. de largo, más ó menos cilíndrico y finamente pubescente. Estilo claviforme; ramas de 3.5–4 mm. de longitud, cubiertas por pelos muy cortos. Aquenio de 4.5–5 mm. de largo por 1–1.1 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus con pelos numerosos, amarillos, los más grandes hasta 15 mm. de longitud. Flor marginal: corola de 19–20 mm. de longitud; tubo de 9.5–10 mm. de largo por 0.5–0.6 mm. de ancho en su base y en la parte superior, encima de la parte media más ancho de 0.8–1 mm., glabro; labio externo de 9.5–10 mm. de largo por 1.8–2 mm. de ancho, 6-nerviado, dorso araneoso y con pelos escasos, cortos, ascendentes, amarillos, el ápice tridentado, los 3 lóbulos agudos, más ó menos iguales, de 0.4–0.6 mm. de largo por 0.3–0.4 mm. de ancho en su base; labio interno entero de 6–7 mm. de largo por 0.3–0.4 mm. de ancho en la base, glabro, largamente atenuado en el ápice, y retorcido. Estilo más ó menos claviforme; ramas de 4.5–5 mm. de longitud, cubiertas por pelos muy cortos. Aquenio de 4.2–5 mm. de largo por 0.9–1 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus con pelos numerosos, amarillos, los más grandes hasta 14 mm. de longitud. LÁM. IV, FIGS. 13–19.

DISTRIBUCIÓN: Habita en el Departamento de Junín, en la región denominada “Ceja de montaña”, altura 600–680 metros.

PERÚ: Junín: La Merced, Agosto 10–24, 1923, *Macbride 5425* (TIPO U. S. Nat. Herb. 1191547); Colonia Perené, Junio 14–22, 1929, *Killip & Smith 24937* (US).

Esta planta es afín a *Onoseris silvatica* Greenm., de la que se diferencia por el tallo más ó menos tomentoso; las hojas son de limbo hastado y de margen poco dentado; los 5 lóbulos de la flor hermafrodita son glabros en el dorso, el tubo de la flor marginal contraído encima de la parte media; la panícula tiene menos capítulos (7–9); además las localidades son distintas.

12. *Onoseris fraterna* Blake, Jour. Wash. Acad. Sci. 33: 368 (1943).

Planta robusta, perenne, hasta 300 cm. de alto, erecta, tallo gris-lanuginoso. Hojas escasas, largamente pecioladas; limbo de 110–120 mm. de largo por 230–240 mm. de ancho, cordiforme, haz araneoso, luego glabrescente, envés gris-lanuginoso, palminerviado, la base con 5 nervios prominentes en el envés, el ápice más ó menos acuminado, margen desigualmente

sinuoso-dentado, los dientes pequeños, separados por trechos de 5–19 mm. Pecíolo de 250–255 mm. de longitud, alado y con lóbulos aovado-lanceolados, de 8–9 pares opuestos ó alternos, los lóbulos mayores de 80–90 mm. de largo por 38–44 mm. de ancho, gradualmente más grandes hacia el limbo. Inflorescencia panícula con 23–24 capítulos heterógamos. El pedúnculo de 230–250 mm. de longitud, anguloso (5 ó 6 ángulos), gris-lanuginoso, adornado por brácteas de 2–9 mm. de largo por 0.4–1.4 mm. de ancho en la base, subuladas, escasas, araneosas en el dorso y más numerosas cerca del involucre. Involucro de 17–23 mm. de altura por 8–12 mm. de diámetro, acampanado; brácteas dispuestas en 6–7 series, las interiores de 16–19 mm. de largo por 2.8–3 mm. de ancho, ápice bruscamente agudo, el dorso araneoso y la costa cubierta de pelos cortos, ascendentes, el margen muy escarioso debajo del ápice; las brácteas exteriores gradualmente menores. Receptáculo plano y provisto de páleas amarillas, heteromorfas y laciniosas. Flor del disco: corola de 11.5–14 mm. de longitud; tubo de 10.8–13 mm. de largo por 1–1.2 mm. de ancho, 5-nerviado, glabro; limbo terminado en 5 lóbulos agudos, 3 lóbulos de 0.6–0.8 mm. de largo por 0.4–0.5 mm. de ancho en su base y 2 de 0.8–1 mm. de largo por 0.6–0.7 mm. de ancho en su base, los 5 ascendentes y glabros en el dorso. Anteras de 4–4.2 mm. de longitud, cola de 2.2–2.8 mm. de largo más ó menos puntiaguda, glabra; filamento de 4–5 mm. de longitud, cilíndrico y finamente pubescente. Estilo cilíndrico glabro; ramas de 1.7–2 mm. de longitud. Aquenio de 4–5 mm. de largo por 1.1–1.3 mm. de ancho, totalmente pubescente, pelos amarillos, ascendentes, cortos, costado; costillas 5, de borde angosto y cubiertas por el indumento. Papus con pelos numerosos, amarillos, más ó menos de la misma altura, los pelos más grandes hasta 16 mm. de longitud. Flor marginal: corola de 18–19 mm. de longitud; tubo de 9–9.5 mm. de largo por 0.8–1 mm. de ancho, glabro; labio externo de 9–9.5 mm. de largo (de igual longitud que el tubo) por 2.8–3 mm. de ancho, 6-nerviado (raramente 7 nervios), dorso araneoso, ápice tridentado, los 3 lóbulos pequeños, agudos, raramente más ó menos obtusos, de 0.2–0.3 mm. de largo por 0.2–0.3 mm. de ancho en su base; labio interno de 7–7.5 mm. de longitud por 0.2–0.3 mm. de anchura en su base, entero, largamente atenuado, glabro y con el ápice poco retorcido. Estilo cilíndrico, glabro; ramas de 2.5–3 mm. de longitud. Aquenio de 4.5–5 mm. de largo por 1.1–1.2 mm. de ancho, totalmente pubescente, pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto y cubiertas por el indumento. Papus igual al de la flor del disco. LÁM. V, FIGS. 1–8.

DISTRIBUCIÓN: Ha sido encontrada en la vertiente oriental de la Cordillera Real de Bolivia, al Este de la ciudad de La Paz.

BOLIVIA: La Paz: Cuenca del Río Bopi, San Bartolomé, cerca de Calisaya, Provincia de S. Yungas, Julio 1–22, 1939, altura 750–900 metros, *Krukoff* 10266 (ISOTIPO G).

Esta especie es próxima á *Onoseris silvatica* Greenm., de la cual se distingue por tener el pecíolo mayor número de lóbulos; además el limbo de las hojas tiene el margen con dientes mucronados; por otra parte los 5 lóbulos de la flor del disco son desiguales; y las brácteas involucrales tienen el dorso más araneoso, grisáceo, y de ápice bruscamente agudo. Se puede observar también que los pelos del papus sobrepasan la longitud de la flor hermafrodita.

13. *Onoseris speciosa* H. B. K. Nov. Gen. et Sp. 4: 7. t. 305 (1820); Less. *Linnaea* 5: 340 (1830).

Seris speciosa Kuntze, Rev. Gen. 1: 364 (1891).

Onoseris Stuebelii Hieron. Bot. Jahrb. 21: 366 (1895).

Planta herbácea, perenne, de 30–65 cm. de alto, acaule, escapo tricéfalo (raramente menos de 3 capítulos), caudex tomentoso y corto. Hojas arrosetadas naciendo del caudex, escasas, hasta 9; limbo de 35–100 mm. de largo por 20–90 mm. de ancho, cordiforme-hastado con orejas generalmente obtusas, de 18–46 mm. de largo por 17–42 mm. de ancho, la base triplinerviada, raramente palminerviada con 5 nervios, ápice frecuentemente agudo, raramente obtuso, el haz araneoso, el envés gris-lanuginoso, el margen desigualmente sinuoso-dentado, los dientes separados por trechos de 5–10 mm. Pecíolo de 18–160 mm. de longitud, alado-lobulado, el haz semi-acanalado, los lóbulos más ó menos aovados, 2 pares, raramente 1–4 pares, opuestos ó alternos, los lóbulos mayores, de 8–46 mm. de largo por 5–32 mm. de ancho, los lóbulos superiores más grandes. Capítulos 1–3, dispuestos en corimbo; escapo gris-lanuginoso y adornado por pelos numerosos, erectos, cortos, más ó menos glandulosos y conspicuos, costado; costillas 6–7, de borde ancho, obtuso, la parte superior del escapo con brácteas de 3–5 mm. de longitud, escasas, subuladas y de dorso pubescente. Involucro de 18–24 mm. de altura por 11–16 mm. de diámetro, acampanado; brácteas dispuestas en 6–7 series, las interiores de 20–24 mm. de largo por 1.2–2 mm. de ancho, ápice largamente atenuado, el dorso araneoso y con pelos glandulosos, conspicuos, y numerosos, margen poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano y desnudo. Flor del disco: corola de 14–16 mm. de longitud; tubo de 12.2–15 mm. de largo por 0.6–1 mm. de ancho en la base y 1.5–2 mm. en la parte superior, pubescente, los pelos cortos, ascendentes, 5-nerviado; limbo terminado en 5 lóbulos, de 1.8–2.8 mm. de largo por 0.6–0.9 mm. de ancho en su base, los 5 agudos, iguales, recurvados, y con el dorso pubescente, los pelos escasos, cortos, y amarillos. Anteras de 6–7 mm. de longitud, cola de 2–3 mm. de largo, puntiaguda y provista de pelos escasos y muy cortos; filamento, de 4–5 mm. de largo, más ó menos cilíndrico y finamente pubescente. Estilo claviforme; ramas de 3–4 mm. de longitud y cubiertas de pelos muy cortos. Aquenio de 3.8–6 mm. de largo por 0.7–1.2 mm. de ancho, pubescente, los pelos muy cortos, ascendentes, y amarillos, costado; costillas 5, de borde angosto y cubiertas por el indumento. Papus con pelos numerosos, amarillos, los más grandes hasta 14 mm. de longitud. Flor marginal: corola de 29–39 mm. de longitud; tubo de 8–9.5 mm. de largo por 0.8–1 mm. de ancho, pubescente, los pelos más ó menos hirsutos, cortos y amarillos; labio externo, de 21–30 mm. de largo por 2.8–3.8 mm. de ancho, 6-nerviado, dorso araneoso y con pelos glandulosos, el ápice tridentado, los 3 lóbulos agudos, más ó menos iguales, de 0.6–1.8 mm. de largo por 0.4–0.6 mm. de ancho en su base; labio interno bipartido, lóbulos de 8–14 mm. de largo por 0.4–0.6 mm. de ancho en su base, glabros, largamente atenuados y retorcidos en el ápice. Estilo claviforme; ramas de 3.2–4.2 mm. de longitud y cubiertas de pelos muy cortos. Aquenio, de 4–6 mm. de largo por 0.6–1.2 mm. de ancho, pubescente, los pelos muy cortos, ascendentes, y amarillos, costado; costillas 5, de borde angosto y cubiertas por el indumento. Papus con pelos numerosos, amarillos, los más grandes hasta 12 mm. de longitud. LÁM. V, FIGS. 9–16.

DISTRIBUCIÓN: A lo largo de los Andes ecuatorianos, desde la Provincia de Chimborazo hasta la de Loja; también en la región septentrional de los Andes peruanos; altura 1200–2600 metros.

ECUADOR: Chimborazo: Huigra, Julio 4–27, 1923, *Hitchcock 20614* (G, US, NY); Hacienda de Licay, Huigra, Agosto 21, 1918, *J. N. Rose 23831* (FM, US, NY, G); Alausi, sin fecha, *Bonpland 3235* (Isotipo FM); Azuay: Río Paute, sin fecha, *Jameson* (G); Loja: Loja y San Lucas, Septiembre 6, 1923, *Hitchcock 21453* (G, US, NY); cerca de la ciudad de Alacete, Julio, 1864, *Jameson* (NY); Dept. ? : Sin localidad, sin fecha, *Jameson* (NY, US); sin localidad, sin fecha, *Jameson* (US); "In Andibus Ecuadorensibus", 1857–9, *Spruce 6005* (G, NY); "Palanda", 1875, *André 4363* (NY); Huancabamba, Noviembre 2, 1876, *André 5* (G); sin localidad, sin fecha, *Bonpland 3235* (Fotografía TIPO G). PERÚ: Dept. ? : "Peruvia", 1862, *Mathews 18* (G, NY).

Esta especie y *Onoseris purpurea* (L.f.) Blake son muy relacionadas, diferenciándose la presente de esta última por ser acaule y tener su escapo más ó menos cilíndrico con 6–7 costillas; sus hojas son radicales arrosetadas; la flor marginal tiene su labio interno bipartido, y la flor del disco tiene sus lóbulos revolutos y con pelos en el dorso. He considerado como sinónimo la especie *Onoseris Stuebelii*, porque tanto la descripción como la fotografía del Tipo (*Stübel 35d*), que posee Gray Herbarium, corresponden a los caracteres del material determinado. No obstante Hieronymus, Bot. Jahrb. 21: 366 (1895), sitúa *O. Stuebelii* entre *Onoseris hieracioides* —que está excluida por pertenecer al género *Trichocline*— y *Onoseris speciosa*, diferenciándola de ésta en: "foliis angustioribus, involucris squamis angustioribus etc." Sin embargo estos caracteres y otros más importantes no denotan una diferencia fundamental que permita separarlas en distintas especies. Por otro lado, las localidades de ambas se deduce que son vecinas porque uno de los ejemplares de *O. speciosa* fué coleccionado en "Peruvia" por Mathews y es sabido que este naturalista vivió mucho tiempo en Chachapoyas, Departamento de Amazonas; y en cuanto á la localidad del Tipo de *O. Stuebelii*: "Tambo de Carizal, in valle fluminis Utcubamba" se encuentra precisamente en el mismo Departamento de Amazonas.

14. *Onoseris purpurea* (L. f.) Blake, Proc. Biol. Soc. Wash. 38: 85 (1925); Less. según DC. Prodr. 71: 34 (1838) (en sinónimo).

Atractylis purpurea L. f. Suppl. Pl. 349 (1781).

Atractylis purpurata L. ex J. E. Sm. Pl. Icon. Ined. 3: 65. t. 65 (1791).

Onoseris purpurata Willd. Sp. Pl. 33: 1702 (1804).

Seris purpurea Kuntze, Rev. Gen. 1: 354 (1891).

Planta sufruticosa, caulescente, perenne, de 32–75 cm. de altura, erecta, gris-lanuginosa, más ó menos hojosa hasta el ápice del tallo. Hojas escasas, largamente pecioladas; limbo de 21–155 mm. de largo por 10–140 mm. de ancho, hastado, haz araneoso, luego glabrescente, envés gris-lanuginoso, palminerviado, la base con 5 nervios prominentes en el envés, el ápice más ó menos agudo, el margen desigualmente sinuoso-dentado, los dientes mucronados. Pecíolo de 15–220 mm. de longitud, alado-lobulado, los lóbulos aovado-lanceolados de 3 hasta 7 pares, opuestos ó alternos, los lóbulos mayores de 15–25 mm. de largo por 6–10 mm. de ancho, gradualmente más grandes hacia el limbo, de margen sinuoso-dentado, el ápice frecuentemente acuminado, raramente agudo, haz araneoso, envés lanugi-

noso, con 1-3 nervios á uno y otro lado de la costa. Capítulos 2-7, largamente pedunculados. Pedúnculo, de 240-450 mm. de longitud, anguloso, albo-lanuginoso, y con pelos semiglobulosos, cortos, erectos, purpurascetes, más numerosos y conspicuos en la parte superior, adornado por brácteas subuladas de 3-8 mm. de longitud por 0.5-1 mm. de ancho en su base. Involucro, de 18-23 mm. de altura por 8-14 mm. de diámetro, acampanado; brácteas dispuestas en 6-8 series, las interiores de 19-24 mm. de largo por 2-2.2 mm. de ancho, ápice largamente atenuado, el dorso araneoso y con pelos cortos, más ó menos erectos, dispuestos á lo largo de la costa, margen poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano cubierto de páleas amarillas, laciniosas, y cortas. Flor del disco: corola de 16-17 mm. de longitud; tubo de 14.2-15 mm. de largo por 0.8-1 mm. de ancho en su base y 1.5-1.6 mm. en la parte superior, pubescente, pelos escasos, cortos, ascendentes, amarillos, 5-nerviado; limbo terminado en 5 lóbulos agudos, iguales, ascendentes, glabros en el dorso, de 1.8-2 mm. de largo por 0.5-0.6 mm. de ancho en su base. Anteras de 5.2-6 mm. de longitud, cola de 2.6-2.8 mm. de largo, puntiaguda, glabra; filamento de 6-7 mm. de longitud, cilíndrico, finamente pubescente. Estilo más ó menos cilíndrico; ramas de 3-4 mm. de longitud, glabrescentes. Aquenio de 3-5 mm. de largo por 0.7-0.9 mm. de ancho, totalmente pubescente, pelos cortos, amarillos, ascendentes, costado; costillas 5, de borde angosto y cubiertas por el indumento. Papus con pelos numerosos, amarillo-oscuro, los más grandes hasta 14 mm. de longitud. Flor marginal: corola de 19-26 mm. de longitud; tubo de 7-9 mm. de largo por 0.5-0.7 mm. de ancho, pubescente, pelos escasos, cortos, y erectos; labio externo de 12-17 mm. de largo por 2.4-3 mm. de ancho, 6-nerviado, dorso araneoso, el ápice tridentado, los 3 lóbulos agudos, iguales, de 0.2-0.3 mm. de largo por 0.2-0.3 mm. de ancho en su base; labio interno entero, de 7-8 mm. de longitud por 0.4-0.5 mm. de anchura en su base, largamente atenuado, glabro, y retorcido. Estilo más ó menos cilíndrico, glabrescente; ramas de 4.5-6 mm. de longitud. Aquenio de 3.2-5 mm. de largo por 0.7-0.9 mm. de ancho, totalmente pubescente, los pelos cortos, amarillos, ascendentes, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus con pelos numerosos, amarillo-oscuro, los más grandes hasta 13 mm. de longitud. LÁM. V, FIGS. 17-22.

DISTRIBUCIÓN: En la región interandina formada por las Cordilleras Central y Oriental del Centro y Sur de Colombia, altura 250-1500 metros.

COLOMBIA: Cundinamarca: La Mesa, Julio, 1923, *Ariste-Joseph* (US); Cundinamarca y Sierra Templada, Febrero, 1916, (*colector* ?) 68 (US); Guaduas, Julio, 1923, *Ariste-Joseph* (US); Caparrapi, Junio 8-13, 1939, *García* 7636 (US); "Guataqui", Julio, 1930, *Pérez Arbeláez* 354 (US); Tolima: Santa Ana, Río Cabrera, 1883, *Lehmann* 2339 (G, US); Río Paez, sin fecha, *Lehmann* 4755 (G, US, FM); Honda, Enero 3-4, 1918, *Pennell* 3603 (G, NY); Ibagué — Girardot, llanos del Tolima, Julio 22, 1939, *Pérez Arbeláez & Cuatrecasas* 6505 (US); Honda, Magdalena, 1875, *André* 562 (NY); Huila: Este de Neiva, Cordillera Oriental, Julio 31, 1917, *Rusby & Pennell* 495 (G, NY); entre Jagua y Laguna, Julio 4, 1926, *Juzepczuk* 5629 (US); Dept. ? : Sin localidad, Julio 5, 1920, *M. Dawe* (US); sin localidad, *Herb. H. B. K.* (Fotografía TIPO FM); sin localidad, Diciembre, 1932, *Arbeláez* 2169 (US); Cordillera Occidental Santamaría, 1918-19, *M. Dawe* 814 (NY).

Esta especie se caracteriza por ser caulescente, el tallo erecto y gris-lanuginoso; el eje de la inflorescencia conspicuamente anguloso (4-5 ángulos), y la parte superior adornada por brácteas subuladas y también

por pelos hispídos más ó menos purpurascetes. El material típico fué colectado por Mutis, "In Nova Granada."

15. *Onoseris sagittata* (Rusby) Rusby, N. Sp. S. Am. Pl. 164 (1920).

Seris sagittatus Rusby, Mem. Torr. Bot. Cl. 6: 69 (1896).

Planta herbácea, perenne, de 12-70 cm. de alto, blanco-lanuginosa, erecta y caulescente. Hojas escasas hasta 18; limbo de 38-94 mm. de largo por 26-52 mm. de ancho, asaetado, la base palminerviada, con 5 nervios, el haz araneoso, luego glabrescente, envés blanco-lanuginoso, el ápice acuminado, el margen desigualmente sinuoso-dentado, los dientes separados por trechos de 6-16 mm. Pecíolo de 30-100 mm. de longitud, alado-lobulado, los lóbulos lanceolados, de 1-3 pares opuestos ó alternos, los mayores de 12-14 mm. de largo por 3-4 mm. de ancho, gradualmente más grandes hacia el limbo, de margen entero, el ápice acuminado ó raramente agudo, haz araneoso, envés blanco-lanuginoso. Inflorescencia escasamente ramosa, capítulos 1-3. Eje de la inflorescencia de 120-440 mm. de longitud, blanco-lanuginoso, luego glabrescente en la parte inferior, costado; costillas 8-10, de borde ancho, obtuso, conspicuas; la parte superior adornada por brácteas de 4-14 mm. de largo por 0.9-1.1 mm. de ancho en su base, subuladas, escasas, y de dorso araneoso. Involucro de 14-15 mm. de altura por 11-12 mm. de diámetro, acampanado; brácteas dispuestas en 5-6 series, las interiores de 15-16 mm. de largo por 2.6-2.8 mm. de ancho, ápice acuminado, el dorso muy araneoso, margen poco escarioso; las brácteas exteriores gradualmente menores. Flor del disco: corola de 14-15 mm. de longitud; tubo de 12.2-13 mm. de largo por 0.7-0.8 mm. de ancho en su base y 1.1-1.2 mm. en la parte superior, 5-nerviado, pubescente, los pelos más ó menos numerosos, cortos, ascendentes, amarillos; limbo terminado en 5 lóbulos agudos, de 1.8-2 mm. de largo por 0.5-0.6 mm. de ancho en su base, iguales, ascendentes y el dorso con pelos escasos, cortos, y amarillos. Anteras de 6-6.5 mm. de longitud, cola de 2-2.2 mm. de largo, puntiaguda, glabra; filamento de 6-7 mm. de largo, cilíndrico y finamente pubescente. Estilo claviforme; ramas de 1.8-2.2 mm. de longitud, cubiertas de pelos muy cortos. Aquenio de 3.5-4 mm. de largo por 0.9-1 mm. de ancho, totalmente pubescente, pelos ascendentes, cortos, amarillos, costado; costillas 5, de borde angosto y cubiertas por el indumento. Papus con pelos numerosos, amarillos, los más grandes hasta 15 mm. de longitud. Flor marginal: corola de 28-29 mm. de longitud; tubo de 7-7.5 mm. de largo por 0.8-0.9 mm. de ancho en la base y 1-1.2 mm. en la parte superior, pubescente, los pelos cortos, amarillos, ascendentes, y más ó menos numerosos; labio externo de 21-21.5 mm. de largo por 3.2-3.5 mm. de ancho, 6-nerviado, dorso araneoso, el ápice tridentado, los lóbulos de 0.5-0.6 mm. de largo por 0.4-0.5 mm. de ancho en su base, agudos, iguales; labio interno bipartido, de 5.5-6 mm. de largo por 0.8-0.9 mm. de ancho en su base, glabro, largamente atenuado, y no retorcido. Estilo claviforme; ramas de 2.5-3 mm. de longitud, cubiertas por pelos muy cortos. Aquenio de 4.2-5 mm. de largo por 1.2-1.4 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus con pelos numerosos, amarillos, los más grandes hasta 14 mm. de longitud. LÁM. VI, FIGS. 1-7.

DISTRIBUCIÓN: Encontrada al centro del territorio boliviano, que comprende el Departamento de Cochabamba.

BOLIVIA: Cochabamba: "In dry gravelly or clayey soil, Turedon, vic. Cochabamba", 1891, *Bang 1139* (ISOTIPO G).

Rusby transfirió el nombre "*Seris sagittatus*" á *Onoseris*, y lo publicó bajo el nombre de "*O. sagittatus*"; sin embargo se debe corregir el género del nombre específico. Es próxima á *Onoseris alata* Rusby, de la cual se diferencia por tener el pecíolo conspicuamente alado-lobulado (1-2 pares), las brácteas involucrales más anchas, de dorso muy araneoso y el ápice acuminado, y finalmente los pelos del aquenio ascendentes. Se acerca también á *Onoseris hastata*, pero esta última es acaule y de escapo monocéfalo. Por no malograr la única flor del Isotipo no se ha descrito el receptáculo.

16. *Onoseris acerifolia* H. B. K. Nov. Gen. et Sp. 4: 8 (1820).

Seris acerifolia Kuntze, Rev. Gen. 1: 364 (1891).

Hipposeris acerifolia Cass. según Jackson, Index Kew. 2: 1164 (1893).

Planta sufruticosa, perenne, de 50-80 cm. de alto, erecta, tallo terete, ramosa, ramas teretes de 80-300 mm. de longitud, totalmente pubescente, los pelos glandulosos más ó menos erectos, de 2-4 mm. de largo. Hojas más ó menos numerosas, largamente pecioladas; limbo de 10-90 mm. de largo por 11-120 mm. de ancho, la base casi cordiforme, palminervada con 7-8 nervios muy prominentes en el envés, el margen lobulado, los lóbulos anchos, angulosos, irregulares, el haz araneoso y con pelos glandulosos, el envés gris ó albo-lanuginoso y con pelos glandulosos erectos y más numerosos en las nervaduras. Pecíolo de 15-75 mm. de longitud terete y adornado por pelos glandulosos erectos. Capitulo solitario y terminal. Pedúnculo de 20-75 mm. de longitud, terete, con pelos glandulosos y con brácteas de 5-9 mm. de largo por 1.5-2 mm. de ancho en su base, totalmente glandulosas, flexuosas, y más numerosas en la parte superior. Involucro de 7-25 mm. de altura por 5-20 mm. de diámetro, hemisférico; brácteas dispuestas en 6-7 series, las interiores de 22-29 mm. de largo por 1.5-2 mm. de ancho, ápice largamente atenuado y flexuoso, dorso araneoso y totalmente glanduloso, los pelos gradualmente más grandes hacia el ápice, margen poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano y cubierto de pelos numerosos, amarillos, cortos y rígidos. Flor del disco: corola de 14-16.5 mm. de longitud; tubo de 12.5-14 mm. de largo por 0.6-0.7 mm. de ancho en su base y 1-1.4 mm. en la parte superior, 5-nerviado, pubescente, los pelos cortos, ascendentes, amarillos; limbo terminado en 5 lóbulos, agudos, iguales, recurvados, de 1.5-2.5 mm. de largo por 0.6-0.8 mm. de ancho en su base, el dorso de los lóbulos con pelos escasos, cortos, amarillos, y cerca del ápice. Anteras de 5.6-7 mm. de longitud, cola de 2.4-3 mm. de largo, puntiaguda, glabra; filamento de 5-6 mm. de longitud, más ó menos cilíndrico y finamente pubescente. Estilo claviforme, glabrescente; ramas de 2.2-3 mm. de longitud. Aquenio de 2.4-5 mm. de largo por 1-1.5 mm. de ancho, totalmente pubescente, los pelos ascendentes, cortos, amarillos, costado; costillas 5-6, de borde angosto, cubiertas por el indumento. Pápus con pelos numerosos, amarillos, los más grandes hasta 13 mm. de longitud. Flor marginal: corola de 33-44 mm. de longitud; tubo de 6-9 mm. de largo por 0.6-1 mm. de ancho, pubescente, los pelos numerosos, glandulosos, erectos; labio externo de 27-35 mm. de largo por 2.8-3.8 mm. de ancho, 6-nerviado (raramente hasta 12 nervios), dorso araneoso y con pelos glandulosos, numerosos, cortos, el ápice tridentado, los lóbulos

agudos, iguales, de 0.6-1.2 mm. de largo por 0.4-0.7 mm. de ancho en su base; labio interno de 5-17 mm. de largo por 0.3-0.5 mm. de ancho en su base, entero, glabro, largamente atenuado, y retorcido en el ápice. Estilo claviforme, glabrescente; ramas de 1.8-2.5 mm. de longitud. Aquenio de 2.4-4.5 mm. de largo por 0.5-1 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes amarillos, rígidos, costado; costillas 5-6, de borde más ó menos angosto, cubiertas por el indumento. Papos con pelos numerosos, amarillos, los más grandes hasta 12 mm. de longitud. LÁM. VI, FIGS. 8-13.

DISTRIBUCIÓN: Se ha encontrado en la región Noroeste del Perú y en el centro de Bolivia, altura 1200-1500 metros.

PERÚ: Cajamarca: Jaén, Provincia Jaén, Abril, 1912, *Weberbauer 6203* (G, FM); *Herb. H. B. K.* (Fotografía TIPO FM). BOLIVIA: Santa Cruz: Samai-pata, Octubre 8, 1928, *Steinbach 8200* (G).

Esta planta, una de las más distintivas del género, se caracteriza por su tallo terete, robusto, y glanduloso; el involucre es conspicuamente hemisférico y sus brácteas involucrales son largamente atenuadas en el ápice, flexuosas, y su dorso totalmente cubierto de pelos glandulosos. La localidad del Tipo, "Provinciae Bracamorensis in devexis Parami de Yamoca inter pagos Colazey et Chontali", se encuentra en el Departamento de Cajamarca. Sin embargo la diagnosis es igual en los ejemplares aquí limitados. Las facies muestran á primera vista pequeñas diferencias de color; por ejemplo el material procedente del Perú se distingue por tener el haz de sus hojas más ó menos parduzco y el envés grisáceo, mientras que el procedente de Bolivia exhibe el haz del limbo verdoso y el envés blanco-lanuginoso. Estos cambios de color se supone que obedecen á los efectos producidos por los distintos procedimientos de desecación.

17. *Onoseris Castelnaeana* Wedd. *Chlor. And.* 1: 10 (1855).

Seris Castelnaeana Kuntze, *Rev. Gen.* 1: 364 (1891).

Planta sufruticosa, perenne, decumbente, albo-lanuginosa, ramosa. Hojas escasas, agrupadas en el extremo de las ramas, largamente pecioladas; limbo de 26-60 mm. de largo por 7-29 mm. de ancho, sagitado ó más ó menos truncado, palminerviado, la base con 5 nervios, haz blanco-araneoso, luego glabrescente-verdoso, envés níveo-lanuginoso, el ápice agudo, margen brevemente dentado, dientes pequeños separados por trechos de 3-7 mm. Pecíolo de 8-30 mm. de longitud, poco alado, alas de borde entero y semi-revoluto. Inflorescencia poco ramificada, capítulos hasta 3. Eje de la inflorescencia de 50-160 mm. de longitud, blanco-lanuginoso, adornado por brácteas de 4-6 mm. de largo, subuladas, escasas, de dorso araneoso, y más numerosas en la parte superior. Involucro de 18-28 mm. de altura por 8-12 mm. de diámetro, acampanado; brácteas dispuestas en 10-12 series, las interiores de 22-24 mm. de largo por 1.8-2 mm. de ancho, ápice acuminado, el dorso araneoso y con pelos cortos, amarillos, rígidos, ascendentes, el margen poco escarioso; las brácteas exteriores gradualmente menores y todas con el ápice curvado hacia fuera. Receptáculo plano, cubierto de páleas amarillas y laciniosas. Flor del disco: corola de 18-22 mm. de longitud; tubo de 15.2-19 mm. de largo por 0.9-1 mm. de ancho en su base y 2-2.2 mm. en la parte superior, 5-nerviado, pubescente, los pelos más ó

menos numerosos, cortos, ascendentes, y dispuestos en los nervios; limbo terminado en 5 lóbulos agudos, iguales, poco recurvados, el dorso adornado por pelos escasos, cortos, y amarillos, los lóbulos de 2.8–3 mm. de largo por 1–1.2 mm. de ancho en su base. Anteras de 7–8 mm. de longitud, cola de 3–3.5 mm. de largo, puntiaguda, glabra; filamento de 6–7 mm. de largo, cilíndrico y finamente pubescente. Estilo claviforme, glabrescente; ramas de 0.8–1 mm. de longitud. Aquenio de 3–3.5 mm. de largo por 1–1.2 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Pápus con pelos numerosos, amarillos, los más grandes hasta 19 mm. de longitud. Flor marginal: corola de 46–48 mm. de longitud; tubo de 11–12 mm. de largo por 1–1.2 mm. de ancho, pubescente en la parte superior, los pelos cortos, escasos y ascendentes; labio externo de 35–36 mm. de largo por 3–3.4 mm. de ancho, 6-nerviado, dorso araneoso, el ápice tridentado, los lóbulos más ó menos agudos, iguales, de 0.4–0.7 mm. de largo por 0.3–0.6 mm. de ancho en su base; labio interno bipartido, lóbulos de 6–7 mm. de largo por 1–1.2 mm. de ancho en su base, glabros, largamente atenuados y más ó menos filiformes. Estilo claviforme, glabrescente; ramas de 1.2–1.4 mm. de longitud. Aquenio de 4–4.2 mm. de largo por 1–1.2 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Pápus con pelos numerosos, amarillos, los más grandes hasta 18 mm. de longitud. LAM. VI, FIGS. 14–19.

DISTRIBUCIÓN: Se ha encontrado solamente en los Departamentos de Apurímac y Cuzco, situados al Sudeste del Perú, altura 2400–2900 metros.

PERÚ: Cuzco: Paruro, Prov. Paruro, Julio 28, 1937, *Vargas 403* (G); Apurímac: Alrededores de Abancay, Prov. Abancay, Agosto 7, 1937, *Vargas 404* (G); Dept. ? : Andes del Perú, Junio, 1847, *Castelnau* (Fotografía TIPO FM); sin localidad, sin fecha, *Castelnau 35* (Fragmentos TIPO FM).

El material que sirvió de Tipo fué colectado por Castelnau en "Pérou!". He visto la descripción original de Weddell, la fotografía del Tipo, y además he examinado algunas hojas y flores del *Castelnau 35*. La identificación se ha hecho con facilidad porque esta planta presenta caracteres muy conspicuos, como por ejemplo las brácteas involucrales que se disponen en 10–12 series; además el ápice es visiblemente curvado hacia fuera; por otra parte las hojas tienen limbo sagitado ó más ó menos truncado en su base. La expedición de Castelnau exploró el Departamento del Cuzco y justamente el material que se ha colocado dentro de esta especie procede de dicho Departamento y también de Apurímac vecino del anterior.

En la descripción de esta especie no se han indicado las dimensiones porque sólo se dispuso de una rama y de un capítulo.

18. *Onoseris Drakeana* André, Rev. Hort. 1883: 180 (1883).

Onoseris Trianae Hieron. Bot. Jahrb. 19: 69 (1894).

Planta sufruticosa, de 26–28 cm. de alto, más ó menos erecta, gris-lanuginosa, hojosa hasta el ápice del tallo. Hojas escasas hasta 12, largamente pecioladas; limbo de 48–90 mm. de largo por 15–50 mm. de ancho, aovado-lanceolado, raramente poco cordiforme, penninerviado con 6–7 nervios á uno y otro lado de la costa, el haz araneoso, luego glabrescente, envés gris-lanuginoso, el ápice agudo, el margen entero ó escasamente dentado, los

dientes pequeños y muy separados. Pecíolo de 27–44 mm. de longitud, ligeramente alado, gris-lanuginoso, las alas brevemente revolutas y con la base más ancha, amplexicaule. Capítulo 1–2, largamente pedunculado. Pedúnculo de 230–240 mm. de longitud, gris-lanuginoso, adornado por brácteas de 3.5–5 mm. de largo, subuladas, escasas, de dorso araneoso y más numerosas cerca del involucre. Involucre de 16–18 mm. de altura por 7–8 mm. de diámetro, acampanado; brácteas dispuestas en 6–7 series, las interiores de 12–13 mm. de largo por 1.2–1.5 mm. de ancho, ápice acuminado, el haz con pelos cortos, rígidos, amarillos, dispuestos cerca del ápice, el dorso araneoso, el margen muy escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano y cubierto de páleas amarillas, cortas, y laciniosas. Flor del disco: corola de 14–15 mm. de longitud, tubo de 12–12.5 mm. de largo por 0.6–0.7 mm. de ancho en su base y 1–1.2 mm. en la parte superior, 5-nerviado, pubescente, los pelos más ó menos numerosos, cortos, ascendentes; limbo terminado en 5 lóbulos agudos, iguales, recurvados, de 2–2.8 mm. de largo por 0.5–0.6 mm. de ancho en su base, y con el dorso pubescente, los pelos escasos, cortos, y amarillos. Anteras de 5–6 mm. de longitud, cola de 2.5–2.8 mm. de largo, puntiaguda, glabra; filamento de 4–5 mm. de longitud, cilíndrico y finamente pubescente. Estilo claviforme, glabro; ramas de 2.5–3 mm. de longitud. Aquenio de 2.5–3 mm. de largo por 0.7–0.8 mm. de ancho, totalmente pubescente, pelos ascendentes, amarillos, más ó menos cortos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Pápus con pelos numerosos, amarillos, los más grandes hasta 13 mm. de longitud. Flor marginal: corola de 20–21 mm. de longitud; tubo de 7.5–8 mm. de largo por 0.6–0.7 mm. de ancho, pubescente, los pelos escasos, cortos, ascendentes, amarillos; labio externo de 12.5–13 mm. de largo por 2–2.4 mm. de ancho, 6-nerviado, dorso araneoso, el ápice tridentado, los lóbulos agudos, iguales, de 0.2–0.3 mm. de largo por 0.2–0.3 mm. de ancho en su base; labio interno entero, de 7–8 mm. de largo por 0.3–0.4 mm. de ancho en su base, glabro, largamente atenuado en el ápice, espiralado, y muy retorcido. Estilo claviforme, glabro; ramas de 3–4 mm. de longitud. Aquenio de 2–2.5 mm. de largo por 0.7–0.8 mm. de ancho, totalmente pubescente, pelos ascendentes, amarillos, más ó menos cortos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Pápus con pelos numerosos, amarillos, los más grandes hasta 12 mm. de longitud.

LÁM. VII, FIGS. 1–6.

DISTRIBUCIÓN: Al Sudoeste de Colombia, en la región Sur del valle del Cauca, altura 1050–1500 metros.

COLOMBIA: Cauca: "Dorotes, prope Mercaderes en alto valle flum. Cauca Novo-Granat.," 25 Aprilis 1876, *André 2917* (ISOTIPO FM); Nariño: "Rio Guaitara, 8 Marz 1881," *Lehmann 541* (G).

Esta especie se acerca á *Onoseris purpurea* (L. f.) Blake, diferenciándose de ésta por tener hojas de limbo aovado-lanceolado y de margen entero ó escasamente dentado; el pecíolo alado sin lóbulos; las brácteas involucrales con el ápice acuminado; los 5 lóbulos de la flor tubulosa recurvados y finalmente el pápus amarillo-claro.

Comparando el Isotipo de *Onoseris Drakeana* perteneciente al Field Museum de Chicago y la fotografía del Tipo de *Onoseris Trianae* Hieron. del Gray Herbarium, resalta con evidencia su similitud; además confrontando las descripciones originales de ambas, no se ha podido encontrar

ninguna diferencia fundamental. Por otra parte la localidad de esta especie, "Dorotes, prope Mercaderes in alto valle flum. Cauca Novo-Granat.," se encuentra entre los límites de los Departamentos del Cauca y Nariño y la localidad de *Onoseris Trianae*, "Cangahua ad Río Juanambu, prov. Pasto," está comprendida en esa región; por todas estas consideraciones se puede deducir que *O. Trianae* es sinónimo de *O. Drakeana* André.

19. *Onoseris hastata* Wedd. Chlor. And. 1: 9. t. 7 (1855).

Seris hastata Kuntze, Rev. Gen. 1: 364 (1891).

Planta herbácea, perenne, de 19–48 cm. de alto, acaule, escapo mono-céfalo. Hojas escasas hasta 15, arrosadas; limbo de 30–48 mm. de largo por 21–46 mm. de ancho, asaetado, la base palminerviada, con 3–5 nervios, el haz araneoso, luego glabrescente verdoso, envés gris-lanuginoso, el ápice agudo, el margen desigualmente sinuoso-dentado, dientes separados por trechos de 5–11 mm. Pecíolo de 50–115 mm. de largo, alado, su haz más ó menos glabrescente-verdoso y envés gris-lanuginoso. Capítulo solitario y escapo costado; costillas 8–10, de borde ancho, obtuso, la parte inferior del escapo glabrescente, la parte superior con brácteas de 4–10 mm. de largo por 0.5–0.8 mm. de ancho en su base, escasas, subuladas, de dorso araneoso-purpurascete, más numerosas cerca del involuero. Involucro de 15–21 mm. de altura por 10–12 mm. de diámetro, acampanado; brácteas dispuestas en 5–6 series, las interiores de 18–20 mm. de largo por 2–2.5 mm. de ancho, ápice acuminado, el dorso araneoso-purpurascete, margen poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano y desnudo. Flor del disco: corola de 13.5–15 mm. de longitud; tubo de 11.5–12.5 mm. de largo por 0.8–1 mm. de ancho en la base y 1.1–1.2 mm. en la parte superior, 5-nerviado, glabro; limbo terminado en 5 lóbulos agudos, iguales, ascendentes, de 2–2.5 mm. de largo por 0.6–0.9 mm. de ancho en su base, pubescentes en el dorso, los pelos escasos, cortos, y ascendentes. Anteras de 5–6 mm. de longitud, cola de 2–2.2 mm. de largo, puntiaguda, glabra; filamento de 4.5–6 mm. de longitud, cilíndrico y finamente pubescente, los pelos más ó menos cortos. Estilo claviforme, glabro; ramas de 1.8–2.2 mm. de longitud. Aquenio de 5–8 mm. de largo por 1–1.2 mm. de ancho, totalmente pubescente, los pelos ascendentes, cortos, amarillos, costado; costillas 5, de borde más ó menos angosto, cubiertas por el indumento. Papus heteromorfo con pelos numerosos, amarillentos, los internos más grandes y casi claviformes, hasta 13 mm. de longitud. Flor marginal: corola de 32–34 mm. de longitud; tubo de 6.5–7.5 mm. de largo por 0.8–1 mm. de ancho, pubescente, los pelos cortos, amarillos, ascendentes, más numerosos en la parte superior; labio externo de 25.5–26.5 mm. de largo por 3.4–3.7 mm. de ancho, 6-nerviado, dorso araneoso y con pelos numerosos, cortos, laxos, y amarillos, el ápice tridentado, los 3 lóbulos de 0.4–0.8 mm. de largo por 0.3–0.5 mm. de ancho en su base, agudos, iguales; labio interno bipartido, de 4.5–5 mm. de largo por 0.9–1 mm. de ancho en su base, glabro, atenuado en el ápice y poco retorcido. Estilo claviforme, glabro; ramas de 3.5–3.8 mm. de longitud. Aquenio de 5–6 mm. de largo por 1–1.2 mm. de ancho, totalmente pubescente, los pelos ascendentes, cortos, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus heteromorfo con pelos numerosos, amarillentos, los internos más grandes y casi claviformes hasta 12 mm. de longitud. LÁM. VII, FIGS. 7–13.

DISTRIBUCIÓN: Ha sido encontrada en la región sur de la Cordillera Central de Bolivia, que comprende el Departamento de Chuquisaca.

BOLIVIA: Chuquisaca: Toldos, cerca Bermejo, Diciembre, 1903, altura 2200 metros, *Fiebrig* 2380 (G, US); Monte Curi, Tomina, *Weddell* 3763 (Fragmentos TIPO G).

Esta planta se puede caracterizar fácilmente porque tiene escapo monocéfalo, hojas con el peciolo conspicuamente alado pero sin lóbulos, y sus brácteas involucrales anchas, atenuadas en el ápice, y de dorso más ó menos araneoso-purpurascente.

20. *Onoseris alata* Rusby, N. Sp. S. Am. Pl. 163 (1920).

Planta herbácea, perenne, de 15–110 cm. de alto, gris-lanuginosa, erecta, caulescente, caudex hasta 120 mm. de longitud. Hojas hasta 22, semi-arrosetadas en el ápice del tallo: limbo de 20–135 mm. de largo por 17–148 mm. de ancho, asietado, la base palminerviada con 5–7 nervios, el haz araneoso, luego glabrescente, envés gris-lanuginoso, el ápice frecuentemente agudo, raramente obtuso, el margen desigualmente sinuoso-dentado, los dientes separados por trechos de 4–22 mm. Peciolo de 18–190 mm. de longitud, alado, casi siempre sin lóbulos, la base más ó menos amplexicaule. Capitulos 1–8. Pedúnculo de 20–280 mm. de longitud. El eje de la inflorescencia de 90–480 mm. de largo, gris-lanuginoso, luego glabrescente, la parte superior adornada por brácteas de 2–6 mm. de largo por 0.5–1 mm. de ancho en su base, subuladas, escasas, de dorso araneoso, costado; costillas 8–10, de borde ancho, obtuso. Involucro de 16–20 mm. de altura por 7–10 mm. de diámetro, acampanado; brácteas dispuestas en 6–7 series, las interiores de 15–19 mm. de largo por 1.4–2 mm. de ancho, ápice agudo, el dorso más ó menos araneoso y conspicuamente verdoso, margen poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano y desnudo. Flor del disco: corola de 13–16 mm. de longitud; tubo de 12–13.8 mm. de largo por 0.7–0.8 mm. de ancho en su base y 1.1–1.2 mm. en la parte superior, 5-nerviado, pubescente, los pelos escasos, cortos, ascendentes, amarillos; limbo terminado en 5 lóbulos agudos, de 1–2.2 mm. de largo por 0.6–0.9 mm. de ancho en su base, iguales, ascendentes y el dorso con pelos escasos, cortos y amarillos. Anteras de 4.2–6 mm. de longitud, cola de 1.8–2.4 mm. de largo, puntiaguda, glabra; filamento de 4–6 mm. de longitud, cilíndrico y finamente pubescente. Estilo claviforme; ramas de 1.8–2 mm. de longitud, cubiertas de pelos muy cortos. Aquenio de 5–6 mm. de largo por 0.8–1.2 mm. de ancho, totalmente pubescente, pelos ascendentes ó más ó menos estrigosos, cortos, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Pappus con pelos numerosos, amarillos, los más grandes hasta 14 mm. de longitud. Flor marginal: corola de 19–29 mm. de longitud; tubo de 8–9 mm. de largo por 0.6–0.8 mm. de ancho, pubescente, los pelos numerosos, cortos, amarillos, ascendentes; labio externo de 11–20 mm. de largo por 2.4–3 mm. de ancho, 6-nerviado, dorso araneoso y con pelos más ó menos numerosos, cortos, amarillos, el ápice tridentado, los lóbulos agudos, iguales, de 0.3–0.5 mm. de largo por 0.3–0.4 mm. de ancho en su base; labio interno bipartido, lóbulos de 3–5 mm. de largo por 0.5–0.7 mm. de ancho en su base, glabro, largamente atenuado, y muy poco retorcido. Estilo claviforme; ramas de 2–2.6 mm. de longitud, cubiertas de pelos muy cortos. Aquenio de 4–6.5 mm. de largo por 1–1.2 mm. de ancho, totalmente pubescente, pelos

más ó menos estrigosos, cortos, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Pápus con pelos numerosos, amarillos, los más grandes hasta 12 mm. de longitud. LÁM. VII, FIGS. 14-20.

DISTRIBUCIÓN: Desde el Sureste de Bolivia que comprende la vertiente oriental de los Andes bolivianos, hasta la región más septentrional de la República Argentina, altura 800-3000 metros.

BOLIVIA: Santa Cruz: Cerro Tres Cruces, Octubre 8, 1928, *Steinbach* 8137 (G); Quebrada de Charagua, Agosto, 1934, *Cárdenas* 2780 (FM); Charagua, Mayo, 1934, *Cárdenas* 2685 (FM); Cochabamba: Cochabamba, Febrero, 1932, *Bro.* *Julio* 276 (US); La Paz: Coroico, Yungas, Julio 30, 1894, *Bang* 2365 (TIPO US; ISOTIPO G); Dept. ? : "Sailapata-Ayopoyo", Marzo, 1935, *Cárdenas* 3109 (US); Indefinido (US). ARGENTINA: Jujuy: Quebrada del río Carapari, Depto. Orán, Julio 15, 1937, *Cabrera* 4210 (FM); Sunchal, 1925, *Cockerell* (US); Sierra de Zenta, Depto. Humahuaca, Febrero 7, 1929, *Venturi* 8358 (G, US); Sierra de Zenta, Depto. Humahuaca, Marzo 7, 1929, *Venturi* 8359 (G, US); Salta: Los Baños, Depto. Rosario de la Frontera, Agosto 2, 1929, *Venturi* 9306 (G, US, NY); Tucumán: Sierra Candelaria al Sur, Depto. Trancas, Julio 15, 1924, *Venturi* 3504 (G, US); "Río Loro, Departamento Burroayaco", Noviembre 25, 1928, *Venturi* 7576 (US); "Cerro del Campo, Departamento Burroayaco", Noviembre 24, 1928, *Venturi* 7575 (G, FM, US); La Ovejera, Depto. Tafi, Mayo 28, 1924, *Venturi* 3404 (US); Valle de Tafi, Depto. Monteros, Febrero 20, 1924, *Venturi* 2892 (US).

Se acerca á *O. hastata* Wedd., de la cual se diferencia por ser caulescente; el eje de la inflorescencia casi siempre policéfalo (2-8 capítulos); sus brácteas involucrales angostas, de ápice agudo y de dorso glabrescente-verdoso.

21. *Onoseris Weberbaueri* sp. nov.

Planta herbacea perennis; caulibus gracilibus; foliis subverticillatis lanceolatis, 7-12 cm. longis, 15-25 mm. latis, infra medium basim versus gradatim attenuatis, supra araneosis mox glabrescentibus, subtus pallidis lanuginosis, margine sinuato-dentatis; capitulis pedunculis scapiformes 35-42 cm. longos terminantibus; receptaculo glabro; floribus heteromorphis, marginalibus ad 38 mm. longis, tubo ad 12 mm. longo pubescente, labio exteriori 25 mm. longo ad 4 mm. lato, labio interiori bifido lobulis ad 14 mm. longis et ca. 0.6 mm. latis apicem versus conspicue contortis; floribus disci ad 18 mm. longis, lobis revolutis aequalibus ad 2.8 mm. longis; pappis homomorphis, pilis numerosis ad 14 mm. longis.

Planta de 60-65 cm. de alto, erecta, más ó menos gris-lanuginosa, luego glabrescente, tallo conspicuamente delgado, costado; costillas 6-8, de borde ancho, obtuso. Hojas hasta 10, arrosetadas, sésiles; limbo de 75-120 mm. de largo por 15-25 mm. de ancho, penninerviado con 7-11 nervios, el haz araneoso, luego glabrescente, envés gris-lanuginoso, ápice más ó menos acuminado, el margen desigualmente sinuoso-dentado, los dientes grandes y separados por trechos de 3-12 mm. Capítulo solitario y terminal. Pedúnculo muy largo y delgado, de 355-420 mm. de longitud, gris-lanuginoso, luego glabrescente, la parte superior adornada por brácteas de 2-2.5 mm. de largo y 0.5-0.7 mm. de ancho en su base, escasas, subuladas, de dorso araneoso, costado; costillas 8-10, de borde ancho, obtuso. Involucro de 18-20 mm. de altura por 8-10 mm. de diámetro, más ó menos acampanado; brácteas dispuestas en 6-7 series, las interiores de 17-20 mm. de largo por 1.2-2 mm. de ancho, ápice agudo, el dorso araneoso, margen

poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano y desnudo. Flor del disco: corola de 17.5–18 mm. de longitud; tubo de 15–15.2 mm. de largo por 0.6–0.7 mm. de ancho en su base y 1.2–1.4 mm. en la parte superior, 5-nerviado, pubescente, los pelos cortos, ascendentes, amarillos; limbo terminado en 5 lóbulos agudos, de 2.5–2.8 mm. de largo por 0.5–0.6 mm. de ancho en su base, pubescentes en el dorso, los pelos cortos, escasos. Anteras de 5.5–6 mm. de longitud, cola de 2.5–3 mm. de largo, puntiaguda, glabra; filamento de 5–5.2 mm. de largo, cilíndrico y finamente pubescente. Estilo claviforme, glabro; ramas de 3.8–4 mm. de longitud. Aquenio de 3–4.5 mm. de largo por 0.5–0.7 mm. de ancho, pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus con pelos numerosos, amarillos, los más grandes hasta 15 mm. de longitud. Flor marginal: corola de 36–38 mm. de longitud; tubo de 11–12 mm. de largo por 0.5–0.6 mm. de ancho en su base y 0.7–0.8 mm. en la parte superior, pubescente, los pelos numerosos, cortos, ascendentes, amarillos; labio externo de 25–26 mm. de largo por 3.6–4 mm. de ancho, 6-nerviado, dorso araneoso y con pelos numerosos, cortos, el ápice tridentado, los 3 lóbulos agudos, iguales, de 0.4–0.5 mm. de largo por 0.3–0.4 mm. de ancho en la base; labio interno bipartido, lóbulos de 13–14 mm. de largo por 0.6–0.7 mm. de ancho en la base, glabro, muy atenuado, y retorcido en el ápice. Estilo claviforme, glabro; ramas de 3.5–3.8 mm. de longitud. Aquenio de 4–4.5 mm. de largo por 0.5–0.6 mm. de ancho, pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus con pelos numerosos, amarillos, los más grandes hasta 14 mm. de longitud. LÁM. VIII, FIGS. 1–6.

DISTRIBUCIÓN: Encontrada en el Norte andino del Perú.

PERÚ: Cajamarca: Cerros situados entre los ríos Tabaconas y Marañón, Abril 23, 1912, altura 1100–1300 metros, *Weberbauer 6163* (Tipo Field Mus. 628892).

El pedúnculo es muy largo y delgado; sus hojas arrosetadas de limbo lanceolado y margen muy dentado sirven para caracterizar esta planta. Es próxima a *O. speciosa*, diferenciándose de ésta por ser caulescente; las hojas son de limbo lanceolado y sus brácteas involucrales de ápice agudo y de dorso araneoso.

Es muy grato para el autor asociar con esta interesante planta el nombre del Profesor Dr. Augusto Weberbauer, cuyas sabias enseñanzas condujeron mi entusiasmo hacia la Taxonomía; botánico de altos relieves, el Dr. Weberbauer ha contribuido enormemente al conocimiento de la Flora del Perú y es por eso que sus esfuerzos han sido bien apreciados por los principales centros científicos del mundo.

22. *Onoseris salicifolia* H. B. K. Nov. Gen. et Sp. 4: 9 (1820); Less. Linnaea 5: 342 (1830).

Seris salicifolia Kuntze, Rev. Gen. 1: 364 (1891).

Hipposeris salicifolia Cass. según Jackson, Index Kew. 2: 1164 (1894).

Planta herbácea, sufruticosa, de 60–122 cm. de alto, erecta, blanco-lanuginosa, ramosa, ramas de 20–130 mm. de longitud. Hojas más ó menos numerosas, semiarrosetadas en el extremo del tallo ó de las ramas; limbo de 30–130 mm. de largo por 4–35 mm. de ancho, lanceolado, de poco espesor, largamente atenuado en la base, la costa con 2–3 nervios á cada lado, el haz

poco araneoso, luego glabrescente-verdoso, envés blanco-lanuginoso, el margen brevemente revuelto y dentado, los dientes pequeños, separados por trechos de 3–12 mm., el ápice usualmente acuminado, raramente agudo. Pecíolo de 2–6 mm. de longitud, blanco-lanuginoso. Capítulo solitario y terminal. Pedúnculo de 100–270 mm. de longitud, blanco-lanuginoso, luego glabrescente, costado; costillas 10–12, de borde ancho, obtuso; la parte superior adornada por brácteas de 7–9 mm. de largo, escasas, subuladas, y de dorso araneoso. Involucro de 13–15 mm. de altura por 12–14 mm. de diámetro, hemisférico; brácteas dispuestas en 6–7 series, las interiores de 11–12 mm. de largo por 1.8–2 mm. de ancho, ápice acuminado, el haz con pelos cortos, rígidos, amarillos, ascendentes, dispuestos cerca del ápice, el dorso araneoso, margen muy escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano y cubierto de páleas amarillas, laciniosas. Flor del disco: corola de 12–14 mm. de longitud; tubo de 8.5–10.5 mm. de largo por 1–1.2 mm. de ancho, 5-nerviado, pubescente, los pelos cortos, amarillos, ascendentes, y dispuestos en forma de anillo cerca de la parte media; limbo terminado en 5 lóbulos, 4 lóbulos iguales de 1.5–2 mm. de largo por 0.4–0.6 mm. de ancho en su base y el quinto de 3.2–4 mm. de largo por 0.7–0.8 mm. de ancho en su base, separado por un seno mayor, los 5 agudos, ascendentes y con el dorso pubescente, los pelos escasos, cortos y amarillos. Anteras de 4.8–5.2 mm. de longitud, cola de 2–2.5 mm. de largo, puntiaguda, glabra; filamento de 4.2–5 mm. de largo, cilíndrico y finamente pubescente. Estilo claviforme; ramas de 2–2.6 mm. de longitud, cubiertas de pelos muy cortos. Aquenio de 3–6 mm. de largo por 0.8–1 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 10 mm. de longitud. Flor marginal: corola de 18–33 mm. de longitud; tubo de 3.8–7.5 mm. de largo por 0.6–0.7 mm. de ancho, pubescente, los pelos cortos, ascendentes, amarillos, y dispuestos en la parte superior; labio externo de 14.2–25.5 mm. de largo por 2.2–2.8 mm. de ancho, 6-nerviado, dorso araneoso, el ápice tridentado, los 3 lóbulos agudos, iguales, de 1–1.5 mm. de largo por 0.6–0.9 mm. de ancho en su base; labio interno bipartido, lóbulos de 2.2–4 mm. de largo, glabros y más ó menos filiformes. Estilo claviforme; ramas de 2.6–4.2 mm. de longitud, cubiertas de pelos muy cortos. Aquenio de 2–3.2 mm. de largo por 0.8–1 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde angosto, cubiertas por el indumento. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 9 mm. de longitud. LÁM. VIII, FIGS. 7–13.

DISTRIBUCIÓN: En el Centro y Sur de los Andes ecuatorianos.

ECUADOR: Chimborazo: Alausi, Junio, 1864, *Jameson* (US); Provincia de Alausi, Julio, 1864, *Jameson* (US); Hacienda Licay, alrededores de Huigra, Agosto 28, 1918, *J. N. Rose* 22422 (G, US, NY); Huigra, Julio 4–27, 1923, altura 1200 metros, *Hitchcock* 20624 (G, US, NY); Huigra, Julio 6, 1921, *Rowlee* 1189 (US); Alausi, sin fecha, *Bonpland* 3226 (Fotografía Tipo G); Azuay: Alrededores de Cuenca, Septiembre 17–24, 1918, *J. N. Rose* 22892 (US); Otavalo a Cuenca, Sibambe, Mayo 27, 1942, altura 1900 metros, *Haught* 3318 (US); ejemplares cultivados: Loja: Cercañas de Loja, 1921, *Popenoe* 582 (DA, 53756 S. P. I.); Loja, 1921, *Popenoe* 1317 (DA, 53756 S. P. I.); Dept. ? : "In Andibus Ecuadorensibus," 1857–59, *Spruce* 6053 (NY); sin localidad, Septiembre 25, 1918, *J. N. Rose* 23913 (US); sin localidad, sin fecha, *Jameson* (US).

Esta especie se caracteriza por su tallo erecto y blanco-lanuginoso; el involucre hemisférico; sus hojas conspicuamente semiarrosetadas, el limbo lanceolado de poco espesor, el haz glabrescente y amarillo-verdoso y el margen más ó menos revuelto y muy poco dentado.

23. *Onoseris albicans* (D. Don) comb. nov.

Centroclinium albicans D. Don, Trans. Linn. Soc. 16: 256 (1829).

Hieracium albicans R. et P. según D. Don, l. c. En sinónimo.

Onoseris integrifolia Less. Linnaea 5: 343 (1830).

Centroclinium reflexum Hook. Bot. Mag. 58: t. 3114 (1831).

Centroclinium appressum Hook. Bot. Mag. 58: t. 3115 (1831).

Centroclinium adpressum Hook. según Less. Syn. Gen. Comp. 119 (1832).

Onoseris reflexa Less. Syn. Gen. Comp. 119 (1832).

Seris reflexa Kuntze, Rev. Gen. 1: 364 (1891).

Seris adpressa Kuntze, l. c.

Seris integrifolia Kuntze, l. c.

Onoseris Warszewiczii Hieron. Bot. Jahrb. 19: 70 (1894).

Planta herbácea, perenne, de 30–80 cm. de alto, erecta, más ó menos blanco-lanuginosa, ramosa. Hojas numerosas, sésiles ó cortamente pecioladas: limbo de 20–92 mm. de largo por 6–35 mm. de ancho, lanceolado, penninerviado, el haz araneoso, luego glabrescente, envés gris-lanuginoso, el ápice frecuentemente acuminado, raramente agudo, el margen conspicuamente revuelto y más ó menos sinuoso-dentado. Pecíolo de 5–10 mm. de longitud, gris-lanuginoso. Capítulo solitario y terminal. Pedúnculo de 70–244 mm. de largo, más ó menos blanco-lanuginoso, la parte superior adornada por brácteas de 4–9 mm. de largo, escasas, subuladas, de dorso araneoso, costado; costillas 8–10, de borde ancho, obtuso. Involucre de 12–20 mm. de altura por 7–13 mm. de diámetro, acampanado; brácteas dispuestas en 5–6 series, las interiores de 10–12 mm. de largo por 2–2.4 mm. de ancho, ápice acuminado, el haz con pelos cortos, rígidos, ascendentes, amarillos, y dispuestos cerca del ápice, el dorso araneoso, margen poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo convexo cubierto de páleas heteromorfas, amarillas y laciniosas. Flor del disco: corola de 12–16 mm. de longitud; tubo de 10–13 mm. de largo por 0.5–0.7 mm. de ancho en su base y 1–1.3 mm. en la parte superior, 5-nerviado, glabro; limbo terminado en 5 lóbulos agudos, 3 lóbulos de 1.6–2.4 mm. de largo por 0.4–0.6 mm. de ancho en su base y 2 lóbulos de 1.8–2.6 mm. de largo por 0.5–0.8 mm. de ancho en su base, separados por un seno mayor, los 5 ascendentes y con el dorso glabro, raramente con pelos escasos y muy cortos. Anteras de 5–7.5 mm. de longitud, cola de 2–2.6 mm. de largo con el ápice filiforme, glabra; filamento de 3–4.8 mm. de largo, cilíndrico y finamente pubescente. Estilo conspicuamente claviforme, glabro; ramas de 2.4–3.2 mm. de longitud. Aquenio de 2.5–6.5 mm. de largo por 0.8–1.3 mm. de ancho, glabrescente ó con pelos escasos, cortos, ascendentes, amarillos, y dispuestos cerca del papus, costado; costillas 5–6, de borde ancho, obtuso. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 14 mm. de longitud. Flor marginal: corola de 26–40 mm. de longitud; tubo de 5.5–7 mm. de largo por 0.6–0.8 mm. de ancho, glabro; labio externo de 20.5–33 mm. de largo por 3.6–4.8 mm. de ancho, 6-nerviado, dorso araneoso, el ápice tridentado, los 3 lóbulos agudos, iguales, de 1.4–3.8 mm. de largo por 1–1.2 mm. de ancho en su base; labio interno bipartido, lóbulos de 2.2–3.5 mm. de largo por 0.8–0.9

mm. de ancho en su base, glabro, raramente la base de los lóbulos con pelos escasos, cortos, el ápice filiforme. Estilo claviforme, glabro; ramas de 3–5 mm. de longitud. Aquenio de 2.5–5 mm. de largo por 0.8–1 mm. de ancho, casi glabrescente, ó con pelos escasos, cortos, ascendentes, amarillos cerca del papus, costado; costillas 5–6, de borde ancho, obtuso. Papus heteromorfo con pelos numerosos, amarillos, los internos más grandes hasta 13 mm. de longitud. LÁM. VIII, FIGS. 14–20.

DISTRIBUCIÓN: Ha sido encontrada en los Andes situados al Sur del Ecuador; Centro y Sur del Perú y al Noroeste de Bolivia; altura 2300–3500 metros.

ECUADOR: A z u a y : Oña y Cuenca, Septiembre 9–10, 1923, *Hitchcock 21579* (G, US, NY); alrededores de Cuenca, Septiembre 17–24, 1918, *J. N. Rose 22892* (G, NY); Prov. ? : Sin localidad, sin fecha, *Lehmann* (G). PERÚ: L i m a : Obrajillo, río Chillón, Junio 15–17, 1925, *Pennell 14496* (G, NY, FM); Obrajillo, sin fecha, *Expedición Wilkes* (US); Purruchuca, sin fecha, *Mathews 570* (G); Viso, Prov. Huarochirí, Abril 23, 1939, *Goodspeed, Stork & Horton 11524* (G, DA); alrededores de Matucana, Julio 9, 1914, *Rose & Rose 18641* (US, NY); Matucana, Abril 12 – Mayo 3, 1922, *Macbride & Featherstone 240* (US, FM, G); Huánuco: Dunkafael, Huánuco, Octubre 28, 1927, *Sawada 77* (FM, US); Indefinido, (*colector?*) 665 (G); J u n í n : Alrededores de Oroya, *Kalenborn 71* (US); H u a n c a v e l i c a : Mejorada, Prov. Huancavelica, Marzo 13, 1939, *Goodspeed, Stork & Horton 10903* (FM); C u z c o : Urquillos, Prov. Urubamba, Marzo 8, 1939, *Vargas, Expedición Goodspeed 11097* (FM, DA); alrededores del Pueblo de Paruro, Prov. Paruro, Junio, 1935, *Vargas 132* (FM, G); Paucartambo, Cuzco, Mayo 4, 1939, *Balls 6686* (US); Challatamba, valle Limatambo, Mayo 14, 1939, *Balls 6835* (US); Dept. Cuzco, sin fecha, *Herrera 2586* (FM); Dept. ? : Sin localidad, *Dombey 25* (Fotografía ISOTIPO G); sin localidad, sin fecha, *Dombey 536* (FM); sin localidad, sin fecha, *Ruiz & Pavón* (G). BOLIVIA: L a P a z : Sorata, Prov. Larecacha, 1857, *Mandon 3* (G, US, NY); Dept. ? : Sin localidad, sin fecha, *Bang 1811* (G, US, NY).

David Don, Trans. Linn. Soc. 16: 256 (1829), describe *Centroclinium albicans* utilizando especímenes del herbario de Ruiz y Pavón, que fueron colectados: "In Peruvia". Dicha descripción es igual á los caracteres de la especie que he limitado, además las localidades probablemente son iguales porque Ruiz y Pavón hicieron sus colecciones en los Departamentos de Lima, Junín, y Huánuco, siendo precisamente estos mismos lugares de donde proceden numerosos ejemplares de esta especie. Con el nombre de *Onoseris integrifolia* ha sido frecuentemente denominada esta planta; la descripción la hizo Lessing, utilizando un ejemplar del herbario de Kunth, colectado por Dombey; este último botánico fué compañero de Ruiz y Pavón y los tres recorrieron las mismas regiones. He visto la descripción y la fotografía del Isotipo de *Onoseris integrifolia*, y ambas corresponden al material aquí definido; es posible que el ejemplar de Dombey proceda de la misma localidad de la de los botánicos españoles. El año 1830, Alexander Cruckshanks, Botanical Miscellany 2: 168, hizo una excursión de Lima á Pasco, pasando por Yangas, Quives, Canta, Obrajillo, etc., y colectó en dicho recorrido numerosas plantas cuyas semillas las envió al Jardín Botánico de Glasgow. Más tarde Hooker describió 2 plantas que habían sido cultivadas con semillas remitidas por Cruckshanks y las incluyó dentro del género *Centroclinium*, diciendo: "are two species of the family of Compositae, and of the division Labiatiflorae, agreeing in so many points with Mr. Don's Genus *Centroclinium* (Linn. Trans. v. 16, 254) that I cannot suppose they are

other than the same," y por eso las designó bajo el nombre de *Centroclinium reflexum* y *Centroclinium appressum*. La descripción y la tábula de las 2 especies de Hooker corresponden á *Onoseris albicans*. La pequeña reflexión ó curvatura que muestra la tábula, en el ápice de las brácteas involucrales de *C. reflexum*, es un carácter que presentan algunos ejemplares examinados. Se supone que por error ortográfico se cita en Syn. Gen. Comp. 119 (1832), "*Centroclinium adpressum*". Hieronymus describió *Onoseris Warszewiczii* de material procedente del Ecuador y la consideró intermedia entre *O. hyssopifolia* H. B. K. y *O. salicifolia* H. B. K. Ni la descripción original de Hieronymus, "*Warszewicz* (n. 34)," ni la fotografía del Tipo denotan diferencias fundamentales con respecto de *O. albicans*, y en mi opinión constituyen una misma entidad.

Esta especie es afín á *O. salicifolia*, de la cual se diferencia principalmente por sus hojas de posición no arrosetada y sus limbos de mayor espesor; el involucro acampanado; el tubo de la flor hermafrodita glabro; el akenio más ó menos glabrescente. Es necesario indicar que esta planta tiene hojas de margen revoluto. Por otra parte el material procedente del Ecuador presenta hojas de limbo angosto y de margen poco dentado (igual al material encontrado en Huancavelica) mientras que los ejemplares del Departamento de Lima (Puruchuca, Obrajillo, Matucana), poseen hojas de limbo ancho y de margen muy dentado, además el ápice de las brácteas involucrales es poco curvado hacia fuera. Finalmente los especímenes colectados en Bolivia se distinguen por sus hojas de limbo ancho pero de margen poco dentado.

24. *Onoseris hyssopifolia* H. B. K. Nov. Gen. et Sp. 4: 9. t. 306 (1820); Less. Linnaea 5: 344 (1830).

Onoseris hyssopifolia a *planifolia* Wedd. Chlor. And. 1: 10 (1855).

Seris hyssopifolia Kuntze, Rev. Gen. 1: 364 (1891).

Planta sufruticosa, bianual, de 30–60 cm. de altura, decumbente, gris-lanuginosa, ramosa, ramas de 40–130 mm. de largo. Hojas numerosas, subsesiles, semiarrosetadas en el extremo del tallo ó de las ramas; limbo de 10–45 mm. de largo por 1–3 mm. de ancho, lineal, largamente atenuado en la base, raquis prominente en el envés, el haz poco araneoso, envés gris-lanuginoso, ápice agudo, raramente acuminado, margen entero y muy revoluto. Pecíolo de 1–1.5 mm. de longitud. Capítulo solitario y terminal. Pedúnculo de 35–235 mm. de largo, gris-lanuginoso, luego glabrescente, la parte superior adornada por brácteas de 2–2.5 mm. de largo, subuladas, escasas, de dorso araneoso, costado; costillas 10–12, de borde ancho, obtuso. Involucro de 10–13 mm. de altura por 6–9 mm. de diámetro, acampanado; brácteas dispuestas en 6–7 series, las interiores de 10–11 mm. de largo por 2.2–3 mm. de ancho, ápice agudo, el haz con pelos cortos, rígidos, ascendentes, amarillos y dispuestos cerca del ápice, el dorso araneoso, margen muy escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano cubierto de páleas heteromorfas, amarillas y laciniosas. Flor del disco: corola de 10–12 mm. de longitud; tubo de 7.8–9.5 mm. de largo por 0.7–0.8 mm. de ancho, 5-nerviado, pubescente cerca de la parte media, los pelos cortos, rígidos, ascendentes, amarillos, y dispuestos en forma de anillo; limbo terminado en 5 lóbulos agudos, ascendentes, 4 lóbulos más ó menos iguales de 0.9–1 mm. de largo por 0.3–0.5 mm. de ancho en su base y el

quinto de 2.2–2.5 mm. de largo por 0.5–0.6 mm. de ancho en la base. Anteras de 3.5–4 mm. de longitud, cola de 2–2.2 mm. de largo, puntiaguda, glabra; filamento de 2.8–4 mm. de largo, casi cilíndrico y finamente pubescente. Estilo claviforme, glabro; ramas de 2–2.8 mm. de longitud. Aquenio de 2–3 mm. de largo por 0.6–0.9 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde ancho, obtuso. Papus con pelos numerosos, amarillos, los más grandes hasta 10 mm. de longitud. Flor marginal: corola de 18.5–26 mm. de longitud; tubo de 4.5–6 mm. de largo por 0.7–0.8 mm. de ancho, pubescente, los pelos cortos, ascendentes, amarillos, más numerosos en la parte superior; labio externo de 14–20 mm. de largo por 3.5–4.5 mm. de ancho, 6-nerviado, dorso araneoso, el ápice tridentado, los 3 lóbulos más ó menos iguales, agudos, de 2–2.8 mm. de largo por 0.8–1.2 mm. de ancho en su base; labio interno bipartido, lóbulos muy cortos, de 1–1.2 mm. de largo por 0.6–0.8 mm. de ancho en su base, su dorso pubescente, los pelos cortos, ascendentes, amarillos, el ápice atenuado. Estilo claviforme, glabro; ramas de 3–3.5 mm. de longitud. Aquenio de 2–5.5 mm. de largo por 0.8–1 mm. de ancho, totalmente pubescente, los pelos cortos, ascendentes, amarillos, costado; costillas 5, de borde ancho, obtuso. Papus con pelos numerosos, amarillos, los más grandes hasta 7 mm. de longitud. LÁM. IX, FIGS. 1–6.

DISTRIBUCIÓN: Endémica de la región septentrional andina de la República del Ecuador, altura 1500–2700 metros.

ECUADOR: Imbabura: Río Guallabamba, cerca Quito, Enero 5, 1880, *Lehmann* 94 (US); Río Guallabamba y Chota, Enero 30, 1881, *Lehmann* 636 (G, US, FM, NY); Río Chota, Junio 7, 1876, *André* 3519 (FM, NY); entre Ibarra y Salinas, Junio 23–24, 1935, *Mexia* 7377 (DA); Ibarra, Junio 23, 1878, *Lehmann* (G); Cima del Pinllar, Febrero 13, 1928, *Firmin* 716 (US, FM); Faldas del Pinllar, Febrero 13, 1928, *Firmin* 380 (G, US); Ibarra, *ex Herb. Kunth* (Fotografía Tipo G); Pichincha: Quito—Otavalo, Noviembre 9, 1939, *Haught* 2926 (US); Oton, Huilabamba á Cayambe, Agosto 4, 1939, *Balls* 7329 (US); alrededores de San Antonio y Pomasqui, Octubre 29, 1918, *J. N. Rose* 23563 (G, US, NY); Ravines, cerca Pomasqui y San Antonio, Septiembre, 1859, *Jameson* 115 (NY); Cotocollao, sin fecha, *Sodiro* 755 (NY), *Mille* 755 (G, US); Prov. ? : Sin localidad, sin fecha, *Bonpland* (FM), *Jameson* 437 (US). Ejemplares cultivados: Ibarra, *Popenoe* 1246 (US, DA, 53178 S. P. I.); sin localidad, *Popenoe* (DA, 62682 S. P. I.).

Es una planta decumbente con numerosas hojas de limbo lineal, de borde muy revuelto, y de haz poco araneoso.

25. *Onoseris gnaphalioides* Muschler, Bot. Jahrb. 50: Beibl. 3: 94 (1913).

Onoseris hyssopifolia β *teretifolia* Wedd. Chlor. And. 1: 10 (1855).

Planta herbácea, perenne, de 11–70 cm. de alto, decumbente, más ó menos ramosa, ramas de 50–200 mm. de largo, gris-lanuginosa. Hojas numerosas, subsesiles, semiarrosetadas en el extremo del tallo ó de las ramas; limbo de 12–55 mm. de largo por 3–8 mm. de ancho, lanceolado, atenuado en su base, el haz muy araneoso ó casi tomentoso, envés gris-lanuginoso, el raquis prominente en el envés, el ápice acuminado, raramente agudo, margen brevemente sinuoso-dentado y revuelto. Pecíolo de 0.5–1 mm. de largo, gris-lanuginoso. Capítulo solitario y terminal. Pedúnculo de 22–165 mm. de longitud, gris-lanuginoso, luego glabrescente, la parte superior adornada por brácteas de 2–7 mm. de largo, subuladas, escasas, y de dorso araneoso, costado; costillas 10–12, de borde ancho, obtuso. Involucro de 8–12 mm. de altura por 4–7 mm. de diámetro,

acampanado; brácteas dispuestas en 6-7 series, las interiores de 11-12 mm. de largo por 1.8-2.2 mm. de ancho, ápice agudo, el dorso araneoso, margen poco escarioso; las brácteas exteriores gradualmente menores. Receptáculo plano, cubierto de páleas heteromorfas, amarillas, y laciniosas. Flor del disco: corola de 7.5-10 mm. de longitud; tubo de 6.5-8 mm. de largo por 0.7-0.9 mm. de ancho, 5-nerviado, glabro; limbo terminado en 5 lóbulos agudos, ascendentes, 3 lóbulos de 0.7-1 mm. de largo por 0.3-0.4 mm. de ancho en su base y 2 lóbulos de 1-2 mm. de largo por 0.4-0.5 mm. de ancho en su base, los lóbulos mayores pubescentes en el dorso, los pelos cortos, amarillos. Anteras de 3-3.5 mm. de longitud, cola de 1-1.5 mm. de largo, puntiaguda, glabra; filamento de 3-4 mm. de largo, cilíndrico, glabrescente. Estilo claviforme, glabro; ramas de 1.6-2 mm. de longitud. Aquenio de 2-4 mm. de largo por 0.6-1 mm. de ancho, glabrescente ó con pelos escasos, cortos, ascendentes, amarillos y dispuestos cerca del papus, costado; costillas 5, de borde ancho, obtuso. Papus con pelos numerosos, amarillos, los más grandes hasta 8 mm. de longitud. Flor marginal: corola de 17-19 mm. de longitud; tubo de 5-6 mm. de largo por 0.5-0.7 mm. de ancho, glabro; labio externo de 12-13 mm. de largo por 2.8-3.4 mm. de ancho, 6-nerviado, dorso araneoso y con pelos numerosos, cortos, ascendentes, amarillos, el ápice tridentado, los 3 lóbulos agudos, iguales, de 0.8-1.2 mm. de largo por 0.5-0.7 mm. de ancho en su base; labio interno bipartido, lóbulos de 1.6-2.2 mm. de largo por 0.4-0.5 mm. de ancho en su base, el dorso de la base con pelos escasos, cortos, ascendentes, amarillos, el ápice atenuado y filiforme. Estilo claviforme, glabro; ramas de 1.8-2 mm. de longitud. Aquenio de 2.5-5 mm. de largo por 0.6-1 mm. de ancho, glabrescente ó provisto de pelos escasos, cortos, ascendentes, amarillos, dispuestos cerca del papus, costado; costillas 5, de borde ancho, obtuso. Papus con pelos numerosos, amarillos, los más grandes hasta 7 mm. de longitud. LÁM. IX, FIGS. 7-12.

DISTRIBUCIÓN: Ha sido encontrada en el Norte, Centro, y Sur de los Andes peruanos y también en la región andina situada al Noroeste de Bolivia, altura 1700-2500 metros.

PERÚ: Piura: Valle del río Huancabamba, entre Sondor y Shumaya, Prov. Huancabamba, Mayo, 1912, *Weberbauer 6281* (G, US, FM); Ancash: Caraz, Mayo 19, 1903, *Weberbauer 3012* (Fotografía TIPO G); Huancavelica: Entre Quichicapota y Puente Mantaro, Prov. Tayacaja, Enero 14, 1939, *Stork & Horton 10399* (FM); Valle del Mantaro, bajo Colcabamba, Prov. Tayacaja, Marzo, 1913, *Weberbauer 6470* (G, FM, US); Apurímac: Pincos, Andahuailas, Marzo, 1927, *Herrera 1491* (G); Río Pachachaca, al Norte de Abancay, Prov. Abancay, Febrero 9, 1939, *Stork, Horton & Vargas 10542* (FM, DA); alrededores de la Población, Prov. Abancay, Agosto 7, 1937, *Vargas 405* (G, FM); Cuzco: Valle Apurímac, Cuzco, 1931, *Herrera 3055* (US); Dept. Cuzco, Octubre, 1839 - Febrero, 1840, *Gay* (G). BOLIVIA: Cochabamba: "Sailapata - Ayopoyo," Abril, 1935, *Cárdenas 3101* (US).

Esta planta se acerca mucho á *O. hyssoipifolia* pero se diferencia de ésta por tener el limbo de sus hojas con el haz muy araneoso, el margen más ó menos dentado; la flor hermafrodita con el tubo glabro y sus 2 lóbulos mayores pubescentes en el dorso; el aquenio glabrescente; las brácteas involucrales más angostas y sin pelos en el haz. Las localidades también son distintas: esta especie procede del Perú (Norte, Centro y Sur andino) y Bolivia (Noroeste andino); en cambio *O. hyssoipifolia* sólo ha sido encontrada en las Provincias de Imbabura y Pichincha, situadas al Norte del Ecuador.

El material procedente del Norte del Perú (*Weberbauer 6281*) presenta pequeñas diferencias con respecto á la típica, como por ejemplo pelos cortos en el dorso de los 5 lóbulos de la flor tubulosa; además los 2 lóbulos del labio interno de la flor marginal son glabros en el dorso.

ESPECIES EXCLUÍDAS

Onoseris altissima Kuntze, Rev. Gen. 1: 354 (1891) = *Centroclinium altissima* Poepp. & Endl. = *Lycoseris* ?

Onoseris atacamensis Hoffm. in E. & P. Nat. Pfl. IV. 5: 335, sub fig. 152 (1893) = *Urmenetea atacamensis* Ph. La descripción y la tábula de *Urmenetea atacamensis* Ph., Flor. Atac. 201. t. 3, fig. A (1860); Benth. & Hook. f. Gen. Pl. 2: 487 (1876); Reiche, Flora de Chile 4: 302 (1905), denotan caracteres peculiares que permiten diferenciarla del género *Onoseris*. Sus hojas son gruesas, coriáceas, el envés rugoso; la corola tubulosa es blanco-rosada, el tubo presenta una dilatación esférica más ó menos cerca de la parte media y las ramas del estilo son obtusas; el aquenio es oblongo y completamente glabro y su papus heteromorfo posee de 5-6 pelos internos más grandes, subulados, mientras que los pelos internos son más numerosos, delgados, y su largo es casi igual á la mitad de la longitud de los pelos mayores.

Onoseris bracteata Kuntze, l. c. = *Lycoseris bracteata* Benth.

Onoseris brevifolia D. Don, Trans. Linn. Soc. 16: 246 (1829-33), según Baker, in Mart. Fl. Bras. 6³: 373 (1884) = *Trichocline polymorpha* Baker.

Onoseris corymbosa (Less.) Benth., según Baker, in Mart. Fl. Bras. 6³: 369. t. 99 (1884), no es *Onoseris*. He visto la descripción original y la ilustración que hace Baker; además he examinado una hoja y fragmentos de un capítulo del Tipo, *Sellow 3479* (FM), y se llega á la conclusión que no pertenece al género *Onoseris*. Son evidentes las siguientes diferencias: hojas de limbo aovado, haz glabro, base triplinervia, los demás nervios muy reticulados; capítulos en corimbo; corola tubulosa con sus lóbulos redondeados; ramas del estilo obtusas y más ó menos revolutas; corola de la flor marginal con los 3 lóbulos del labio externo redondeados; las facies son también distintas, además esta especie procede del Brasil y probablemente pertenece al género *Gochnatia*.

Onoseris denticulata Willd. según DC. Prodr. 7¹: 22 (1838), Index Kew. 2: 350 (1894) = *Lycoseris denticulata* Cass.

Onoseris discolor Muschler, Bot. Jahrb. 50: Beibl. 3: 94 (1913). La descripción del Tipo y su fotografía parecen indicar que pertenece al género *Liabum*.

Onoseris ?eriocephala Benth. Pl. Hartw. 211 (1841-43), según el Index Kew. 2: 350 (1894) = *Hieracium erianthum* H. B. K.

Onoseris glandulosa Hieron. Bot. Jahrb. 21: 366 (1895). He visto la descripción original de esta especie así como la fotografía del Tipo, y me parece que pertenece al género *Liabum* y posiblemente á la especie *Liabum Szyzylowiczii* Hieron.

Onoseris grandis Kuntze, Rev. Gen. 1: 354 (1891) = *Lycoseris grandis* Benth.

Onoseris heterophylla Spreng. Syst. Veg. 3: 503 (1826), según el Index Kew. 2: 350 (1894) = *Trichocline heterophylla* Less.

Onoseris hieracioides Bert., según DC. Prodr. 7¹: 29 (1838), non H. B. K. (1820); según el Index Kew. 2: 350 (1894) = *Chaetanthera Berteriana* Less.

Onoseris hieracioides H. B. K. Nov. Gen. et Sp. 4: 7. t. 304 (1820) = *Trichocline hieracioides* (H. B. K.) comb. nov.

Onoseris ?lanata Phil. Cat. Pl. Tarapacá 32. t. 2 (1891), según Reiche, Flora de Chile 4: 363 (1905) = *Trichocline caulescens* Phil.

Onoseris lanuginosa Wall. Cat. n. 2929, p. 101 (1830), según el Index Kew. 2: 350 (1894) = *Gerbera lanuginosa* Sch. Bip.

Onoseris latifolia Kuntze, l. c. = *Lycoseris latifolia* Benth.

Onoseris linifolia Bert. Merc. Chil. n. 16: 737 (1829), según Cabrera, Rev. Mus. La Pla. 1: 175 (1937) = *Chaetanthera microphylla* (Cass.) Hook. & Arn.

Onoseris macrophylla Wall. según Steud. Nom. ed. 2. 216 (1841), según el Index Kew. 2: 350 (1894) = *Gerbera nepalensis* Sch. Bip.

- Onoseris mexicana* Willd. Sp. Pl. 3³: 1703 (1804), según el Index Kew. 2: 350 (1894) = *Lycoseris mexicana* Cass.
- Onoseris montevidensis* Spreng. Syst. Veg. 3: 502 (1826), según el Index Kew. 2: 350 (1894) = *Leucopsis diffusa* Baker.
- Onoseris nepalensis* Steud. Nom. ed. 2. 216 (1841), según el Index Kew. 2: 350 (1894) = *Gerbera nepalensis* Sch. Bip.
- Onoseris ovalifolia* Wall. l. c., según el Index Kew. 2: 350 (1894) = *Gerbera piloselloides* Cass.
- Onoseris spathulata* Phil. Anal. Mus. Nac. Chil. 31 (1891); Reiche, Flora de Chile 4: 302 (1905). En opinión del autor esta especie no pertenece al género *Onoseris*, porque de acuerdo con la diagnosis original se pueden establecer las siguientes diferencias: las hojas tienen limbo conspicuamente espatulado y los pelos del papus son completamente blancos (no amarillos). Esta planta procede de Ascotan, Provincia de Tarapacá; esta región se caracteriza por ser más ó menos seca y se encuentra al Norte de Chile.
- Onoseris squarrosa* Kuntze, l. c. = *Lycoseris squarrosa* Benth.
- Onoseris stricta* Spreng. Syst. Veg. 3: 503 (1826), según el Index Kew. 2: 350 (1894) = *Trixis stricta* Less.
- Onoseris trinervis* Kuntze, l. c. = *Diazeuxis trinervis* Don = *Lycoseris* ?
- Onoseris triplinervia* Kuntze, l. c. = *Lycoseris triplinervia* Less.
- Onoseris turbacensis* Spreng. Syst. Veg. 3: 502 (1826), según el Index Kew. 2: 350 (1894) = *Lycoseris mexicana* Cass.
- Seris amplexicaulis* Gardn. in Hook. Journ. Bot. 6: 456 (1847) = *Richterago amplexifolia* (Gardn.) Kuntze.
- Seris angustifolia* Gardn. op. cit. 457, según el Index Kew. 2: 885 (1895) = *Trichocline angustifolia* Baker.
- Seris corymbosa* (Less.) Kuntze, Rev. Gen. 1: 364 (1891). Comparar con *Onoseris corymbosa* (Less.) Benth., *supra*.
- Seris denticulata* DC. Prodr. 7¹: 20 (1838), según el Index Kew. 2: 885 (1895) = *Trichocline polymorpha* Baker.
- Seris discoidea* Less. Linnaea 5: 255 (1830) = *Richterago discoidea* (Less.) Kuntze.
- Seris eriocephala* (Benth.) Kuntze, l. c. = *Hieracium erianthum* H. B. K.
- Seris hieracioides* (H. B. K.) Kuntze, l. c. = *Trichocline hieracioides* (H. B. K.) Ferreyra, *vide supra*.
- Seris polymorpha* Gardn. in Hook. Ic. Pl. 6: t. 501 (1843), según el Index Kew. 2: 885 (1895) = *Trichocline arenaria* Baker.
- Seris polymorpha* Less. Linnaea 5: 254 (1830), según el Index Kew. 2: 885 (1895) = *Trichocline polymorpha* Baker.
- Seris polyphylla* Baker, in Mart. Fl. Bras. 6³: 354 (1884) = *Richterago polyphylla* (Baker) comb. nov.
- Seris rupestris* Malme, Arkiv Bot. 24A, no. 8: 55 (1932), no *S. rupestris* Kuntze (1891) = *Richterago Malmei* nom. nov.
- Seris vaginata* Gardn. in Hook. Ic. Pl. 6: t. 501 (1843) = *Richterago amplexifolia* (Gardn.) Kuntze.

ESPECIES DUDOSAS

- Onoseris integrifolia* Less. var. *brachyphylla* Cuatr. Anal. Univ. Madrid 42: 237 (1935). Su descripción es muy pobre, sólo dice: "Squamae mediae et interiores late lanceolatae"; la localidad que indica es: "Peru: Quebrada de San Mateo". El ejemplar Tipo fué colectado por Isern (no. 382, Septiembre 25, 1863); dicho ejemplar se conserva en Madrid. Probablemente corresponde á *O. albicans*.

EXPLICACION DE LAS LAMINAS

LÁMINA I

FIGS. 1-6. *Onoseris odorata* (D. Don) Hook. & Arn., dibujado de *Weberbauer 5314*: 1. planta, $\times \frac{1}{3}$; 2. flor del disco, $\times 4$; 3. lóbulos de la flor del disco, dorso, $\times 4$; 4. estambre de la flor del disco, $\times 4$; 5. flor marginal, $\times 2\frac{1}{3}$; 6. bráctea interior del involucro, haz, $\times 3\frac{1}{2}$. FIGS. 7-12. *Onoseris Cumingii* Hook. & Arn., dibujado de *Haught 30*: 7. planta, $\times \frac{1}{3}$; 8. flor del disco, $\times 5$; 9. lóbulos de la flor del disco, dorso, $\times 5$; 10. estambre de la flor del disco, $\times 5$; 11. flor marginal, $\times 2\frac{2}{3}$; 12. bráctea interior del involucro, haz, $\times 5$. FIGS. 13-18. *Onoseris amplexicaulis* Ferreyra, dibujado de *Macbride & Featherstone 310*: 13. planta, $\times \frac{1}{3}$; 14. flor del disco, $\times 5$; 15. lóbulos de la flor del disco, dorso, $\times 5$; 16. estambre de la flor del disco, $\times 5$; 17. flor marginal, $\times 3\frac{1}{3}$; 18. bráctea interior del involucro, haz, $\times 3\frac{1}{2}$.



REVISIÓN DEL GÉNERO ONOSERIS

LÁMINA II

FIGS. 1-6. *Onoseris annua* Less., dibujado de *Dombey*: 1. planta, $\times \frac{1}{3}$; 2. flor del disco, $\times 5\frac{1}{3}$; 3. lóbulos de la flor del disco, dorso, $\times 5\frac{1}{3}$; 4. estambre de la flor del disco, $\times 5\frac{1}{3}$; 5. flor marginal, $\times 3\frac{1}{3}$; 6. bráctea interior del involucro, haz, $\times 3\frac{1}{3}$. FIGS. 7-12. *Onoseris minima* Domke, dibujado de *Weberbauer 7440*: 7. planta, $\times \frac{1}{3}$; 8. flor del disco, $\times 6\frac{2}{3}$; 9. lóbulos de la flor del disco, dorso, $\times 6\frac{2}{3}$; 10. estambre de la flor del disco, $\times 6\frac{2}{3}$; 11. flor marginal, $\times 5$; 12. bráctea interior del involucro, haz, $\times 5$. FIGS. 13-18. *Onoseris costaricensis* Ferreyra, dibujado de *Pittier 3312*: 13. hoja, $\times \frac{1}{3}$; 14. inflorescencia, $\times \frac{1}{3}$; 15. flor hermafrodita, $\times 3\frac{1}{3}$; 16. estambre, $\times 3\frac{1}{3}$; 17. lóbulos de la flor hermafrodita, dorso, $\times 3\frac{1}{3}$; 18. bráctea interior del involucro, haz, $\times 3\frac{1}{3}$.



LÁMINA III

FIGS. 1-6. *Onoseris Donnell-Smithii* (Coult.) Ferreyra, dibujado de Standley 19701: 1. hoja é inflorescencia, $\times \frac{1}{8}$; 2. flor hermafrodita, $\times 3\frac{1}{8}$; 3. lóbulos de la flor hermafrodita, dorso, $\times 3\frac{1}{8}$; 4. estambre, $\times 3\frac{1}{8}$; 5. bráctea interior del involucro, dorso, $\times 2\frac{3}{8}$; 6. bráctea interior del involucro, haz, $\times 2\frac{3}{8}$. FIGS. 7-11. *Onoseris onoseroides* (H. B. K.) Robinson, dibujado de Langlassé 759: 7. hoja é inflorescencia, $\times \frac{1}{8}$; 8. flor hermafrodita, $\times 2$; 9. lóbulos de la flor hermafrodita, dorso, $\times 2$; 10. estambre, $\times 2$; 11. bráctea interior del involucro, haz, $\times 2$.

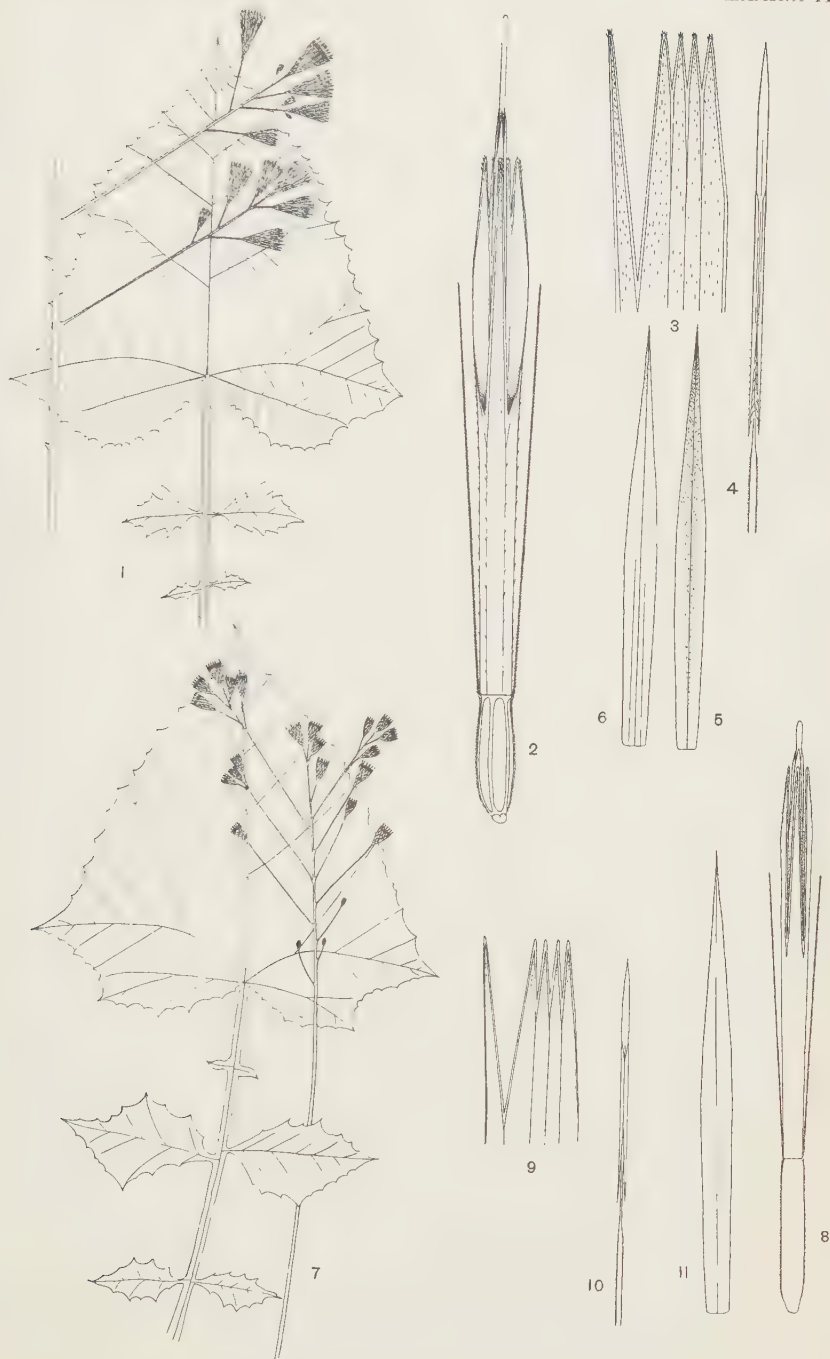


LÁMINA IV

FIGS. 1-6. *Onoseris silvatica* Greenm., dibujado de Pittier 1622: 1. planta, $\times \frac{1}{2}$; 2. flor del disco, $\times 2\frac{1}{3}$; 3. estambre de la flor del disco, $\times 2\frac{1}{3}$; 4. lóbulos de la flor del disco, dorso, $\times 2\frac{1}{3}$; 5. flor marginal, $\times 2\frac{1}{3}$; 6. bráctea interior del involucro, dorso, $\times 2\frac{1}{3}$. FIGS. 7-12. *Onoseris silvatica* var. *colombiana* Ferreyra, dibujado de Killip 34429: 7. hoja é inflorescencia, $\times \frac{1}{3}$; 8. flor del disco, $\times 2\frac{2}{3}$; 9. lóbulos de la flor del disco, dorso, $\times 2\frac{2}{3}$; 10. estambre, $\times 2\frac{2}{3}$; 11. flor marginal, $\times 2\frac{2}{3}$; 12. bráctea interior del involucro, dorso, $\times 3\frac{1}{3}$. FIGS. 13-19. *Onoseris peruviana* Ferreyra, dibujado de Macbride 5425: 13. planta, $\times \frac{1}{3}$; 14. flor del disco, $\times 2\frac{2}{3}$; 15. lóbulos de la flor del disco, dorso, $\times 2\frac{2}{3}$; 16. estambre, $\times 2\frac{2}{3}$; 17. flor marginal, $\times 2\frac{2}{3}$; 18. bráctea interior del involucro, dorso, $\times 2\frac{1}{3}$; 19. bráctea interior del involucro, haz, $\times 2\frac{1}{3}$.



LÁMINA V

FIGS. 1-8. *Onoseris fraterna* Blake, dibujado de *Krukoff 10266*: 1. hoja, $\times \frac{1}{8}$; 2. inflorescencia, $\times \frac{1}{8}$; 3. flor del disco, $\times 3\frac{1}{8}$; 4. lóbulos de la flor del disco, dorso, $\times 3\frac{1}{8}$; 5. estambre de la flor del disco, $\times 3\frac{1}{8}$; 6. flor marginal, $\times 3\frac{1}{8}$; 7. bráctea interior del involucre, dorso, $\times 2$; 8. bráctea interior del involucre, haz, $\times 2$. FIGS. 9-16. *Onoseris speciosa* H. B. K., dibujado de *Mathews 18*: 9. planta, $\times \frac{1}{8}$; 10. capitulo, $\times \frac{1}{8}$; 11. hoja, $\times \frac{1}{8}$; 12. bráctea interior del involucre, haz, $\times 2$; 13. flor del disco, $\times 3$; 14. estambre de la flor del disco, $\times 3$; 15. lóbulos de la flor del disco, dorso, $\times 3$; 16. flor marginal, $\times 2\frac{1}{8}$. FIGS. 17-22. *Onoseris purpurea* (L. f.) Blake, dibujado de *Lehmann 4755*: 17. planta, $\times \frac{1}{8}$; 18. flor del disco, $\times 2\frac{2}{8}$; 19. estambre de la flor del disco, $\times 2\frac{2}{8}$; 20. lóbulos de la flor del disco, dorso, $\times 2\frac{2}{8}$; 21. flor marginal, $\times 2\frac{2}{8}$; 22. bráctea interior del involucre, haz, $\times 2\frac{2}{8}$.



REVISIÓN DEL GÉNERO ONOSERIS

LÁMINA VI

FIGS. 1-7. *Onoseris sagittata* (Rusby) Rusby, dibujado de *Bang 1139*: 1. planta, $\times \frac{1}{8}$; 2. flor del disco, $\times 3\frac{1}{2}$; 3. lóbulos de la flor del disco, dorso, $\times 3\frac{1}{2}$; 4. estambre de la flor del disco, $\times 3\frac{1}{2}$; 5. pistilo de la flor del disco, $\times 3\frac{1}{2}$; 6. flor marginal, $\times 2\frac{1}{2}$; 7. bráctea interior del involucro, haz, $\times 3\frac{1}{2}$. FIGS. 8-13. *Onoseris acerifolia* H. B. K., dibujado de *Weberbauer 6203*: 8. planta, $\times \frac{1}{8}$; 9. flor del disco, $\times 2\frac{2}{3}$; 10. estambre de la flor del disco, $\times 2\frac{2}{3}$; 11. lóbulos de la flor del disco, dorso, $\times 2\frac{2}{3}$; 12. flor marginal, $\times 2$; 13. bráctea interior del involucro, haz, $\times 2$. FIGS. 14-19. *Onoseris Castelnanaeana* Wedd., dibujado de *Vargas 403 y 404*: 14. capítulo y rama, $\times \frac{1}{8}$; 15. flor del disco, $\times 2\frac{1}{2}$; 16. estambre de la flor del disco, $\times 2\frac{1}{2}$; 17. lóbulos de la flor del disco, dorso, $\times 2\frac{1}{2}$; 18. flor marginal, $\times 1\frac{2}{3}$; 19. bráctea interior del involucro, haz, $\times 2\frac{1}{2}$.



REVISIÓN DEL GÉNERO ONOSERIS

LÁMINA VII

FIGS. 1-6. *Onoseris Drakeana* André, dibujado de *André 2917*: 1. planta, $\times \frac{1}{6}$; 2. flor del disco, $\times 2\frac{2}{3}$; 3. estambre de la flor del disco, $\times 2\frac{2}{3}$; 4. lóbulos de la flor del disco, dorso, $\times 2\frac{2}{3}$; 5. flor marginal, $\times 3\frac{1}{3}$; 6. bráctea interior del involucro, haz, $\times 3\frac{1}{3}$. FIGS. 7-13. *Onoseris hastata* Wedd., dibujado de *Fiebrig 2380*: 7. planta, $\times \frac{1}{6}$; 8. flor del disco, $\times 2\frac{2}{3}$; 9. lóbulos de la flor del disco, dorso, $\times 2\frac{2}{3}$; 10. estambre de la flor del disco, $\times 2\frac{2}{3}$; 11. flor marginal, $\times 2\frac{1}{3}$; 12. dorso del labio externo de la flor marginal, $\times 2\frac{1}{3}$; 13. bráctea interior del involucro, haz, $\times 2\frac{1}{3}$. FIGS. 14-20. *Onoseris alata* Rusby, dibujado de *Steinbach 8137*: 14. planta, $\times \frac{1}{6}$; 15. flor del disco, $\times 2\frac{2}{3}$; 16. lóbulos de la flor del disco, dorso, $\times 2\frac{2}{3}$; 17. estambre de la flor del disco, $\times 2\frac{2}{3}$; 18. pistilo de la flor del disco, $\times 2\frac{2}{3}$; 19. flor marginal, $\times 2\frac{1}{3}$; 20. bráctea interior del involucro, haz, $\times 2\frac{1}{3}$.



REVISIÓN DEL GÉNERO *ONOSERIS*

LÁMINA VIII

FIGS. 1-6. *Onoseris Weberbaueri* Ferreyra, dibujado de *Weberbauer 6163*: 1. planta, $\times \frac{1}{3}$; 2. flor del disco, $\times 2\frac{2}{3}$; 3. lóbulos de la flor del disco, dorso, $\times 2\frac{2}{3}$; 4. estambre de la flor del disco, $\times 2\frac{2}{3}$; 5. flor marginal, $\times 2$; 6. bráctea interior del involucre, haz, $\times 2\frac{2}{3}$. FIGS. 7-13. *Onoseris salicifolia* H. B. K., dibujado de *Hitchcock 20624*: 7. planta, $\times \frac{1}{3}$; 8. flor del disco, $\times 3$; 9. pistilo de la flor del disco, $\times 3$; 10. estambre de la flor del disco, $\times 3$; 11. lóbulos de la flor del disco, dorso, $\times 3$; 12. flor marginal, $\times 2$; 13. bráctea interior del involucre, haz, $\times 3$. FIGS. 14-20. *Onoseris albicans* (D. Don) Ferreyra, dibujado de *Pennell 14496*: 14. planta, $\times \frac{1}{3}$; 15. flor del disco, $\times 3\frac{1}{3}$; 16. estambre de la flor del disco, $\times 3\frac{1}{3}$; 17. lóbulos de la flor del disco, dorso, $\times 3\frac{1}{3}$; 18. pistilo de la flor del disco, $\times 3\frac{1}{3}$; 19. flor marginal, $\times 1\frac{2}{3}$; 20. bráctea interior del involucre, haz, $\times 3\frac{1}{3}$.



LÁMINA IX

FIGS. 1-6. *Onoseris hyssopifolia* H. B. K., dibujado de *Lehmann 636*: 1. planta, $\times \frac{1}{3}$; 2. flor del disco, $\times 3\frac{1}{3}$; 3. estambre de la flor del disco, $\times 3\frac{1}{3}$; 4. lóbulos de la flor del disco, dorso, $\times 3\frac{1}{3}$; 5. flor marginal, $\times 2\frac{1}{3}$; 6. bráctea interior del involucro, haz, $\times 3\frac{1}{3}$. FIGS. 7-12. *Onoseris gnaphalioides* Muschler, dibujado de *Stork, Horton & Vargas 10542*: 7. planta, $\times \frac{1}{3}$; 8. flor del disco, $\times 5$; 9. lóbulos de la flor del disco, dorso, $\times 5$; 10. estambre de la flor del disco, $\times 5$; 11. flor marginal, $\times 3\frac{1}{3}$; 12. bráctea interior del involucro, haz, $\times 3\frac{1}{3}$.



SUPPLEMENTARY NOTES ON THE ADVENTIVE AND WEED
FLORA OF THE LEEWARD COASTS OF FIJI

WILLIAM GREENWOOD

THE present paper has been prepared as a supplement to the writer's recent treatment of the subject in Proc. Linn. Soc. 154: 92-106. 1943. A number of records of weeds and introduced plants were omitted from the original article, either because the specimens had not been definitely determined when that paper was prepared or because the species had not at that time been discovered in Fiji. In addition to discussing these entities, the present treatment mentions certain range-extensions and includes further notes on a few species previously discussed. This supplement, like the original article, deals only with plants found on the leeward coasts between sea-level and an elevation of about 2000 feet. Families are discussed in the order of Bentham & Hooker's *Genera Plantarum*.

As in my first treatment, I herewith list a few weeds and introduced plants which have not yet been recorded from Fiji and which are known from other regions than the leeward coasts:

Psidium littorale Raddi (1820) (*P. Cattleianum* Sabine, 1821). Navua region, Viti Levu, *Greenwood*, May 1943.

Borreria laevis (Lam.) Griseb. Nandarivatu, Tholo North, Viti Levu, *Greenwood*, May 1941.

Lindernia anagallis (Burm. f.) Pennell. Navua region, Viti Levu, *Greenwood*, May 1943.

Lindernia diffusa (L.) Wettst. Namosi, Viti Levu, *Greenwood*, May 1943.

Pilea microphylla (L.) Liebm. Namosi region, Viti Levu, *Greenwood*, May 1943.

Cyperus Haspan L. Navua region, Viti Levu, *Greenwood*, May 1943.

Scirpus Purshianus Fernald (*S. debilis* Pursh, non Lam.). Navua region, Viti Levu, *Greenwood*, May 1943.

Echinochloa stagnina (Retz.) Beauv. Navua region, *Greenwood*, May 1943.

Collection numbers found in the text italicized in parentheses refer to the writer's specimens. These are inserted only in cases where the species has not previously been reported from Fiji. Duplicates of most of these are deposited either at the Arnold Arboretum or at the Gray Herbarium.

Some of the plants discussed below were determined by members of the staff of the Royal Botanic Gardens, Kew, for whose coöperation I am grateful. I also wish to thank Dr. E. D. Merrill and Dr. A. C. Smith, of the Arnold Arboretum, for certain identifications and for assistance in the preparation of this supplement.

ANNONACEAE

Cananga odorata (Lam.) Hook. f. & Thoms.

Found naturalized near Lambasa, Vanua Levu, and in the Singatoka district, Viti Levu.

POLYGALACEAE

Polygala paniculata L.

In open places from sea-level up to 1000 ft. in the Lautoka and Nandi districts, Viti Levu. Also common in other parts of the archipelago (see Smith in *Sargentia* 1: 45. 1942).

PORTULACACEAE

Portulaca quadrifida L.

On islands off the mouth of the Lambasa River, Vanua Levu.

ELATINACEAE

Elatine gratioloides A. Cunn.

Creeping on mud and forming small mats under two or three inches of slowly running water in taro plantations at about 2000 ft. alt., in mountains, Lautoka district, Viti Levu (952). This is possibly native to Fiji, as it may have been obtained in 1860 by Seemann and referred by him to *E. ambigua* Wight.

MALVACEAE

Sida microphylla Cav.

On limestone formation near coast, Singatoka district, Viti Levu.

RUTACEAE

Aegle Marmelos (L.) Correa

Sometimes found, but uncommon, in the Lautoka and Rarawai districts of Viti Levu up to 300 ft. alt. and usually near settlements (970).

Citrus spp.

The lemon is found on the leeward coasts of both large islands from sea-level up to 2000 ft., usually near watercourses. The shaddock also occurs on both large islands, but usually only above 1000 ft. The orange is found in the Singatoka district, Viti Levu. In view of the uncertainties of the nomenclature of *Citrus*, I refrain from applying binomials to these naturalized forms.

LEGUMINOSAE

Crotalaria mucronata Desv.

As pointed out by Smith (in *Sargentia* 1: 39. 1942), this plant has been erroneously known as *C. Saltiana* Andr., and as such I have already discussed it (in *Proc. Linn. Soc.* 154: 96. 1943).

Atylosia scarabaeoides (L.) Benth.

On open grassy hillsides up to 1000 ft., in mountains, Lautoka, Viti Levu, a record from higher elevation than reported by me in *Proc. Linn. Soc.* 154: 97. 1943.

Indigofera tinctoria L.

Roadside weed, Lautoka, Viti Levu. This record is based on *Degener & Ordonez 13626*, as mentioned in *Sargentia* 1: 39. 1942.

Mimosa invisa Mart.

On river-bank land on the Government Experimental Farm, Singatoka, Viti Levu. At this locality only one patch of the species was seen and efforts were being made to kill it before it had a chance to spread. Unfortunately it appears to have become established in several places on the wet side of Viti Levu. For additional notes, see Smith in Bull. Torrey Bot. Club 70: 540. 1943.

Leucaena glauca (L.) Benth.

Throughout the leeward coasts of both large islands from sea-level to about 600 ft. alt., locally known as *vaiyai*. This South American plant covers large areas on the leeward coasts and may be found just behind the mangrove formation and on low hills up to several miles from the coasts. It is reported that horses which feed on this plant lose the hair of their tails.

The species was collected by Seemann, but not by the botanists of the U. S. Exploring Expedition, indicating that it may have arrived in Fiji during the intervening period, perhaps about 1850.

Albizia procera (Roxb.) Benth.

Semi-naturalized on low hills near sea-level in the Lautoka district of Viti Levu (794).

ONAGRACEAE

Jussiaea erecta L.

Common near sea-level throughout the leeward coasts of both large islands, in drains and other wet places.

PASSIFLORACEAE

Passiflora suberosa L.

Lautoka, near sea-level, Viti Levu. This species first appeared at Lautoka about 1931 and is still not common, showing no tendency to become a pest. It was common near Levuka, Ovalau, when I was there in 1918. Reported from Fiji by Smith in Sargentia 1: 65. 1942.

Passiflora maliformis L.

This species was well established on the leeward coasts of both large islands in 1917. Mentioned in Sargentia 1: 65. 1942, and in Proc. Linn. Soc. 154: 98. 1943.

Passiflora foetida L. var. *hispida* (DC.) Killip.

Nandi district, Viti Levu, near sea-level. This plant was recorded as *P. foetida* in Proc. Linn. Soc. 154: 99. 1943. It is spread by birds and may very possibly become a bad weed throughout the leeward coasts.

CARICACEAE

Carica Papaya L.

The pawpaw is found naturalized on the leeward coasts of both large islands from sea-level to 2000 ft.

CUCURBITACEAE

Citrullus vulgaris Schrad.

The watermelon is sometimes seen in waste places near settlements on the leeward coasts of both large islands.

Cucurbita Pepo L.

The pumpkin is often found growing near settlements on the leeward coasts of both large islands.

Luffa cylindrica (L.) M. Roem.

Near the coast, Lautoka, Nandi, and Singatoka districts, Viti Levu.

Coccinea cordifolia (L.) Cogn.

Near sea-level, Lautoka district, Viti Levu. First noticed about 1940, this species thus far shows no tendency to spread.

AIZOACEAE

Sesuvium portulacastrum L.

On limestone rocks on the seashore in the Singatoka district, Viti Levu. The plants in this unusual habitat had red stems only about 1.5 ft. long, with purplish red flowers. In its usual habitat on the mud-flats just behind the mangrove formation, the species has nearly white stems up to 5 or 6 ft. long and the flowers are also nearly white.

RUBIACEAE

Hedyotis biflora (L.) Lam.

On limestone rocks along coast, Singatoka district, Viti Levu (918). Also represented from the same region by *Degener 15111*. Not previously recorded from Fiji.

COMPOSITAE

Elephantopus mollis H. B. K.

To my previous notes on this species (in Proc. Linn. Soc. 154: 99. 1943) should be added mention of the occurrence of the species in the Nandi district, Viti Levu.

Erigeron pusillus Nutt.

Sandy soils near coast, Singatoka district, Viti Levu (921). This appears to be a recent arrival, which has not previously been recorded from the Pacific region. Its occurrence in Australia was noted by Robinson in his informative discussion of the status of *E. pusillus* as contrasted with *E. canadensis* L. (in *Rhodora* 15: 205-209. 1913). The species is now represented by several New Zealand and Australian specimens in the Gray Herbarium and may be expected from other Pacific groups. It occurs, according to Robinson, along the American coast from New England south to northern South America.

Xanthium italicum Moretti

The occurrence of this weed in the Singatoka district, Viti Levu, should be noted in addition to the distribution recorded in Proc. Linn. Soc. 154: 99. 1943.

Mikania micrantha H. B. K.

First recorded under this name from Fiji by Smith, in *Sargentia* 1: 141. 1942. This common weed has passed as *M. scandens* Willd., having first been reported as a potential pest in Fiji in *Kew Bull.* 1907: 306. 1907.

SOLANACEAE

Cestrum nocturnum L.

Recorded from the region below Nandarivatu, Tavua district, Viti Levu, alt. 2000 ft., by Gibbs (in Jour. Linn. Soc. Bot. 39: 158. 1909), who states that she was told that the plant was common in other parts of the leeward coast of Viti Levu. In this she was probably misinformed, as there are no other records of it from the leeward coasts and I have never observed it there, although I recently collected it near the Navua River, on the wet side of Viti Levu.

Lycopersicum esculentum Mill.

The tomato is found naturalized in waste places near settlements on the leeward coasts of both large islands.

SCROPHULARIACEAE

Scoparia dulcis L.

Lambasa district, Mathuata coast, Vanua Levu (525). Often seen in moist places, but not a bad weed.

ACANTHACEAE

Hemigraphis colorata (Bl.) Hall. f.

Lautoka district, Viti Levu (9834). This plant is semi-naturalized in shady places about European houses and Indian settlements. It has also been seen in similar situations in the Navua region in the wet zone of Viti Levu.

Thunbergia fragrans Roxb.

Found in waste places in the Nandi district of Viti Levu. I have already listed this species from the Lautoka district (in Proc. Linn. Soc. 154: 102. 1943).

VERBENACEAE

Duranta repens L.

Lautoka, Viti Levu (1003). This species, the seeds of which are spread by birds, is sometimes found in waste places. It is also represented by *Gillespie* 2068, from Fiji but without definite locality.

Stachytarpheta urticaefolia (Salisb.) Sims

In Sargentia 1: 114. 1942, Moldenke records this common weed under the above name. In the literature pertaining to Fijian weeds it has previously gone under the names of *S. indica*, *S. dichotoma*, and *S. jamaicensis* (see Proc. Linn. Soc. 154: 102. 1943). A form with pure white flowers has been seen but is uncommon.

Lantana aculeata L.

In my original article (in Proc. Linn. Soc. 154: 102. 1943) two introduced insects were mentioned as helping to check this plant. Reference should have been made to *Teleonemia lantanæ* Dist., which also has a considerable controlling influence. I am indebted to the Government Entomologist, Mr. R. J. Lever, for drawing my attention to this omission. In Sargentia 1: 114. 1942, Moldenke discusses *L. aculeata* as *L. Camara* var. *aculeata* (L.) Moldenke.

LABIATAE

Leucas lavandulifolia Sm.

Singatoka district, Viti Levu (916). This weed, which is rather common on sandy soils, is probably a recent arrival, as it has not previously been recorded from the vicinity of Fiji.

NYCTAGINACEAE

Mirabilis Jalapa L.

Already reported from the Lautoka district (in Proc. Linn. Soc. 154: 103. 1943), this weed also occurs near sea-level on sandy soils in the Singatoka district, Viti Levu.

Pisonia aculeata L.

Near Tavua, Tavua district, Viti Levu (741). This species is known in Fiji only from a few clumps first seen in this locality in 1927.

POLYGONACEAE

Antigonon leptopus Hook. & Arn.

Found semi-naturalized about settlements in hedges and waste places in the Lautoka district of Viti Levu. Apparently not previously reported from Fiji.

EUPHORBIACEAE

Phyllanthus urinaria L.

Near Penang Mill, Ra, Viti Levu. Found in wet land but not a bad weed.

Euphorbia cf. *australis* Boiss.

On sandy soils near coast, Singatoka district, Viti Levu (922). This species, which is referred by Dr. L. Croizat to the relationship of *E. australis*, is becoming troublesome on the Singatoka golf links, where it tends to smother the couch grass (*Cynodon dactylon* Pers.). Each plant spreads out in a cushion close to the ground, has a tap root, and seeds profusely.

AMARYLLIDACEAE

Agave sisalina Perr.

On dry hillsides in the Lautoka and Rarawai districts, Viti Levu. An escape from cultivation and now quite naturalized.

POTAMOGETONACEAE

Diplanthera uninervis (Forsk.) Aschers.

Near low water mark, Thuvu Beach, Singatoka district, Viti Levu (927). Guppy, who spent some time in Fiji studying the beach plants, does not mention this, but it is easily overlooked. It has previously been reported from Fiji as *Halodule australis* Miq., but specimens have not been cited.

Ruppia maritima L.

In brackish water, Singatoka district, Viti Levu. Previously reported from the Penang district of Viti Levu (in Proc. Linn. Soc. 154: 104. 1943).

CANNACEAE

Canna indica L.

Lautoka district, Viti Levu. Sometimes found in wet places.

HYDROCHARITACEAE

Hydrilla verticillata (L. f.) Royle

Nandi River, Nandi District, Viti Levu, collected by Mr. G. Dennis (955). Very plentiful near the railway bridge across this river (sometimes known as the Tuna River). It forms masses some yards in extent during the dry season when the river level is low, but much of it is swept away when the river rises during the wet season.

CYPERACEAE

Eleocharis geniculata (L.) R. & S.

Depressions near coast containing water after rains, Singatoka district, Viti Levu (925). For application of this binomial, see Svenson in *Rhodora* 41: 50. 1939. In recent years the species has been known as *E. caribaea* (Rottb.) Blake, after having passed for a long time as *E. capitata* R. Br. It has not previously been reported from Fiji.

GRAMINEAE

The grasses of Fiji are discussed by Summerhayes and Hubbard (in *Kew Bull.* 1927: 18-44. 1927, 1930: 252-265. 1930), and additional notes are recorded by Smith from identifications by Mrs. Agnes Chase (in *Sargentia* 1: 5-6. 1942, and in *Bull. Torrey Bot. Club* 70: 534. 1943). For determinations of some of the species discussed below I am indebted to Mrs. Chase.

The majority of the grasses known in Fiji are introduced and can be weeds. Some of these are now known to have a range within the leeward coast areas much greater than that already recorded, and such range-extensions are given below, together with notes on a few species.

Vetiveria zizanioides (L.) Nash

Nandi and Singatoka districts, Viti Levu.

Amphilophis glabra (Roxb.) Stapf

Leeward coasts of both islands from near sea-level to 2000 ft.

Andropogon pertusus (L.) Willd.

Near Lautoka, Viti Levu (819). First noticed about 1930. The plants spread out from the base and form flat tussocks, seeding profusely. Stock do not appear to like it. In identifying this plant, Mrs. Chase notes: "One of the many forms, but this agrees with Hackel's *genuinus* better than does most of our material from India, the type locality." The species has not previously been reported from Fiji.

Dichanthium caricosum (L.) A. Camus

Through the leeward coasts of both large islands at low elevations.

Cymbopogon coloratus Stapf

Low hills near Lautoka, Viti Levu. This species, the "lemon grass," is an escape from cultivation and is now quite naturalized.

Heteropogon contortus (L.) Beauv.

Low hills in Nandi and Singatoka districts, Viti Levu.

Themeda quadrivalvis (L.) Kuntze

Plentiful near Lautoka, Viti Levu, but not seen elsewhere. Thus far it has not become a weed in cultivated land.

Digitaria pruriens (Trin.) Buese

Throughout the leeward coasts of both large islands. This is sometimes a bad weed in cultivated land.

Eriochloa procera (Retz.) C. E. Hubbard

On low-lying wet ground near sea-level in the Lautoka and Nandi districts, Viti Levu.

Brachiaria distachya (L.) Stapf

At low elevations throughout the leeward coasts of both large islands.

Paspalum distichum L.

On low dry hills near Lautoka, Viti Levu.

Paspalum paniculatum L.

Lautoka, Viti Levu (969). Only a few plants of this grass were seen, for the first time, on roadsides near Lautoka during April, 1943. It has been found near Navua, in the wet zone of Viti Levu, and it will be interesting to see whether it spreads in the dry zone. Seed of this grass was imported from Queensland by the Fiji Department of Agriculture in 1924; *P. Galmarra* F. M. Bailey is a synonym.

Paspalum conjugatum Berg

Throughout the leeward coasts of both large islands.

Paspalum vaginatum Sw.

Near the seashore on the leeward coasts of both large islands.

Paspalum dilatatum Poir.

At low elevations on the leeward coasts of both large islands. In some years this grass is very badly attacked by ergot.

Stenotaphrum secundatum (Walt.) Kuntze

Near Ellington, Penang district, and Thuvu, Singatoka district, Viti Levu. In both these places the species occurs on sandy soil on the seashore. It seems strange that it has not been observed elsewhere on the leeward coasts, while it was noticed growing well near Nandarivatu, Viti Levu, at about 2700 ft. alt. and miles inland.

Echinochloa colona (L.) Link

Throughout the leeward coasts of both large islands.

Sacciolepis indica (L.) Chase

Near sea-level at Thuvu, Singatoka district, Viti Levu.

Rhynchelythrum roseum Stapf & Hubbard

Leeward coasts of both islands, from sea-level to about 1000 ft. alt.

Pennisetum polystachyon Schult.

From sea-level to about 1200 ft. alt. in the Tavua, Rarawai, Lautoka, and Singatoka districts, Viti Levu. This species seems to be becoming a

widespread grass throughout the leeward coast of Viti Levu, particularly on hill land. In May, 1941, it covered acres of the hills in the Tavua district near Waikumbakumba and was also observed in the Rarawai district. In June, 1941, a few plants were seen at about 1000 ft. alt. on dry rolling hills inland from Lautoka. By June, 1943, these few plants had spread until the species covered several acres. In May, 1943, a small patch was noticed in the Singatoka district.

In Kew Bull. 1930: 260. 1930, the species is described as a tufted annual or perennial up to 4.5 ft. high. In Fiji it is a perennial, dying down in the dry season but always green at the base, and up to 6 ft. high.

Cenchrus echinatus L.

At low elevations throughout the leeward coasts of both large islands.

Sporobolus elongatus R. Br.

From near sea-level to about 600 ft. alt. in the Lautoka and Singatoka districts, Viti Levu. In Kew Bull. 1930: 262. 1930, this grass is recorded from "Rarawai, road from Nursery to Dumtas." The last word is an error for "Quarters" (the buildings where the single men at each sugar mill are housed) and was due to my poorly written herbarium label.

Eragrostis unioloides (Retz.) Nees

Roadside near sea-level, Thuvu, Singatoka district, Viti Levu. Only one small patch was noticed in 1942, and the species appears to be a new arrival in the dry zone of Viti Levu. It was observed on roadsides in the Navua district, in the wet zone of Viti Levu, in 1939.

Cynodon dactylon Pers.

At low elevation throughout the leeward coasts of both large islands.

Eleusine indica (L.) Gaertn.

Leeward coasts of both large islands at low elevations.

COLONIAL SUGAR REFINING CO.,
LAUTOKA, VITI LEVU, FIJI.

